

MODERN

June, 1948

# Machine Shop

A HEAVY DUTY  
BORING and THREADING

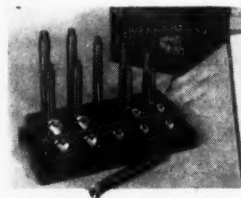
## Tool Holder

*with*

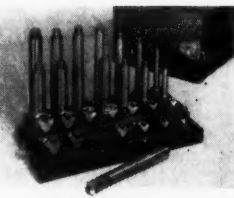
**VERTICAL ADJUSTMENT**

It is designed to fit all sizes of Bokum Boring Tools up to No. 12 either direct or with split sleeve adapters. Greatly facilitates the accurate setting of tools to proper height.

Complete set consists of holder and 6 adapters—compactly arranged in a handy box. Send for folder B-483.



*Now* **BORING  
TOOLS in  
SETS**



This set, J-812, is composed of boring and facing cutters from No. 4 to No. 8 with 1 set of standard and 1 set of extra long shanks to fit  $\frac{3}{4}$ " boring chuck.

This set, J-1016, is composed of boring and facing cutters from No. 4 to No. 10 with 1 set each of standard and extra long shanks to fit 1" boring chuck.

Send for folder B-1139-6.



TRADE MARK REG. U. S. PAT. OFF.

**BOKUM TOOL CO.**

14775 WILDEMERE AVE. • DETROIT 21, MICH.

✓ R v.21' June - Sept. 1948

Get Complete Details Now  
on the New  
**GORTON**  
ALL-PURPOSE MACHINE

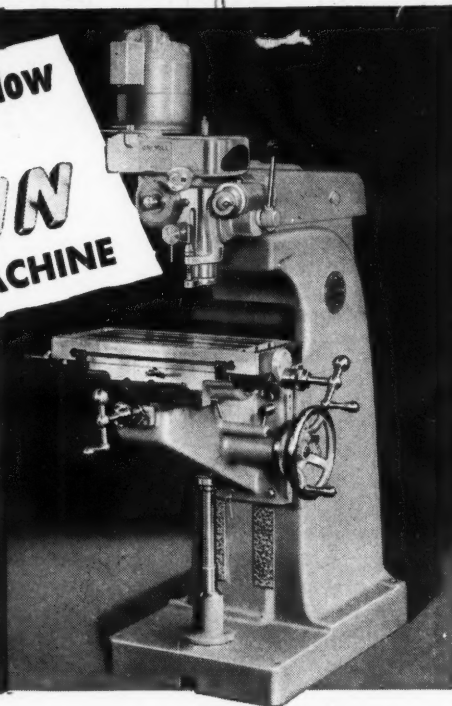
ANNOUNCING THE NEW  
**O-16A SUPER-SPEED  
MILLING MACHINE**

Indispensable in the Tool and  
Machine Shop... Adaptable for Gen-  
eral Engraving, Brass Routing, Die and  
Mold Duplicating

This new O-16A \*Gorton Super-Speed mill in-  
corporates all of the features necessary in an  
"all purpose" machine. It will do a better  
job for you on any work within the limits  
of its size.

The Gorton O-16A is rugged. It is designed for  
operator convenience and features extremely  
sensitive table and saddle controls. Spindle  
speeds from 300 to 10,000 R.P.M. available.  
1/2 H.P. motor.

\*Trade Mark Reg. U. S. Pat. Office

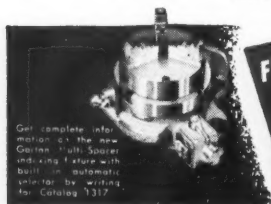


DESIGNED FOR VERSATILE DUTY—  
Check These Features

Heavy column, adjustable ram, super-speed spin-  
dle permanently lubricated, swivel or universal  
head, positive spindle brake, spindle lock, quill  
lock, depth stop graduated in thousandths, mi-  
crometer and lever feed on spindle.

Adaptable for . . .

. . . General engraving and brass routing by  
using special extension spindle and foot treadle  
attachments . . . Die and mold duplicating  
by adding tracer head and dupli-  
cator table.



Get complete infor-  
mation on the new  
Gorton Tracer  
and duplicator with  
built-in automatic  
tracer by writing  
to Catalog 1312

FREE INFORMATION FREE

PLEASE SEND WITHOUT OBLIGATION  
Bulletin No 1655-1706

Name.....  
Company.....  
Position.....  
Address.....  
City..... State.....



**GEORGE GORTON MACHINE CO.**  
*Tracer Controlled Milling*  
1706 RACINE STREET • RACINE, WISCONSIN, U. S. A.

*Teck*



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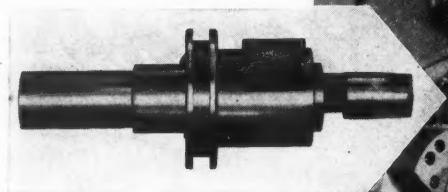
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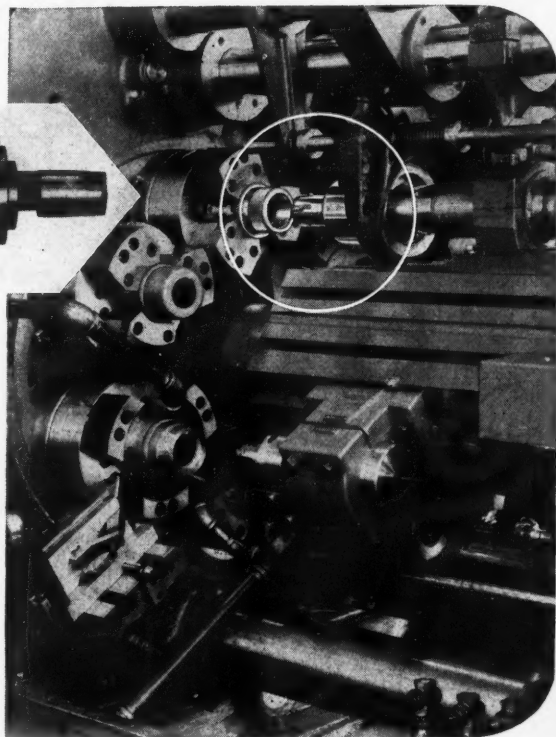
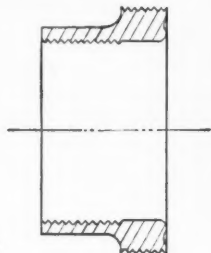
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# IMPROVED LANDIS TAP...



• CUTS INTERNAL  
TAPERED THREADS  
AT 30 FEET PER  
MINUTE.



11½ pitch tapered threads 1-5/16" in length were tapped in quick change unions at 30 feet per minute. The pipe was cold worked forging 2¾" diameter of 185-220 Brinell hardness.

Landis LL Receding Chaser Collapsible Taps are designed primarily for tapping tapered

threads to A.P.I. standards. The detachable tap head permits using various size tap heads to cover a wide range of thread sizes with a minimum amount of equipment. The LL Tap Body is made in four sizes to cover a range of nominal pipe sizes from 1" to 12", inclusive.

**Write for Bulletin G-95**

**LANDIS MACHINE CO.**  
WAYNESBORO, PA., U.S.A.

Not just an "improvement"...it's

# ALL NEW!

New features of this

Heald Model 271

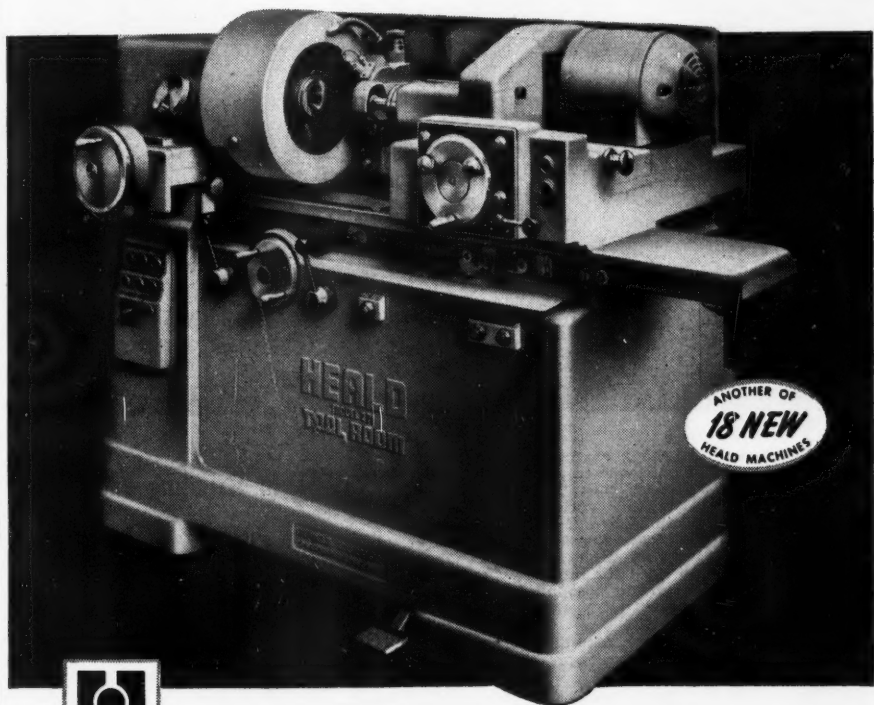
Tool Room Grinder

help to increase accuracy  
and simplify operations

THIS IS a completely new, completely different type of internal grinder, specially designed to finish single parts or small-lot work. It's the Heald 271 Tool Room Model—handles a wide variety of work with exceptional accuracy.

The Model 271 features fingertip adjustments, wide-swiveling workhead, and an extremely sensitive handwheel. It means more precision in your tool room grinding, easier work for the operator.

Contact the Heald branch office nearest you for further information. Or write for the Model 271 bulletin which lists complete features and specifications.

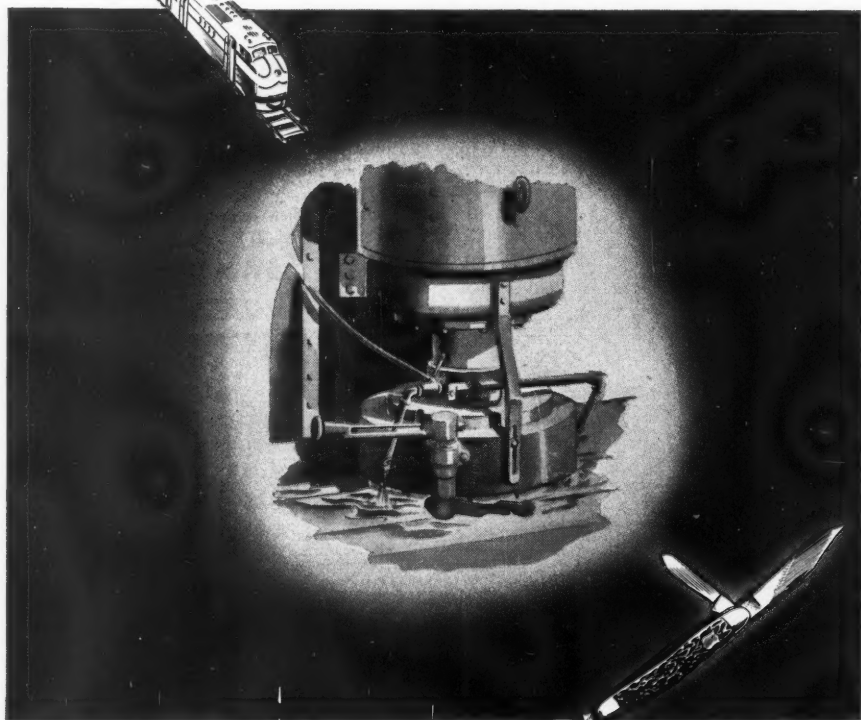


**THE HEALD MACHINE COMPANY, Worcester 6, Mass.**

Branch Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • Lansing • New York



## FROM RAILROADS TO CUTLERY



Your only reason for buying grinding, buffing or cut-off equipment is to make production more profitable. To help you do this, Bridgeport makes machines known all over the world for ruggedness and advanced engineering. Bridgeport engineering includes not only equipment engineers but abrasive specialists. Perhaps most important of all we "live" with every installation until the buyer is completely satisfied that he never made a sounder investment in production machinery.



Your inquiry regarding Bridgeport Grinders will have prompt attention.

Just off the press . . .

Bridgeport's New Model 400 Cutlery Grinder catalog. Write for it today.

**FIRST** in Grinding Equipment

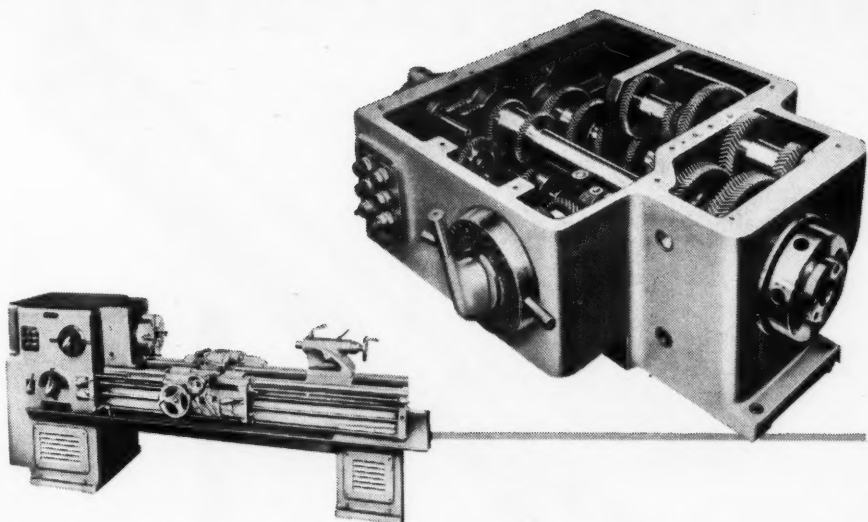
**Bridgeport**



**GRINDERS**

Horizontal, Vertical, Cutlery, Knife, Floor Grinders. Buffing Lathes, Cut-off Machines, Buxite Abrasive Wheels.

**BRIDGEPORT SAFETY EMERY WHEEL CO.**  
1305 West Broad St., Stratford, Conn.



## THESE PC\* GEARS PROVIDE "a smoother rolling action"

The Sidney Machine Tool Company first started using Farrel-Sykes, continuous tooth, herringbone gears in their lathes some twenty years ago. In their own words:

\*PRECISION CUT by the famous Farrel-Sykes process of gear generation.

"... We have met with considerable success in their use, and especially so in the last years when so many manufacturers have turned to the use of carbide-tipped cutters, as we find in this transmission a smoother rolling action which materially prolongs the life of carbide-tipped cutters. We employ this type of transmission throughout our entire line of 16-speed and 32-speed lathes."

Farrel-Sykes, continuous tooth, herringbone gears are available to you, too, in any size up to 20 feet in diameter, for practically any application. Information and engineering assistance available, without obligation.

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*Farrel-Birmingham*

FB-452



Maybe

## A SPIRAL FLUTE TAP

IS  
WHAT  
YOU  
NEED



**If** your tapping problem involves bottoming holes . . . or deep holes . . . the solution may be in the use of a Hanson-Whitney spiral flute tap that is most effective when made by the Hanson-Whitney method, and with the Hanson-Whitney background of "ground after hardening" experience.

The spiral flute tap, made with flutes and threads of the same hand, draws the chips *from* the hole. This prevents chip clogging and provides free flow of coolant.

**HANSON-WHITNEY MACHINE CO. HARTFORD 1, CONN.**  
Division of Whitney-Hanson Industries, Inc.

**Hanson  
Whitney**

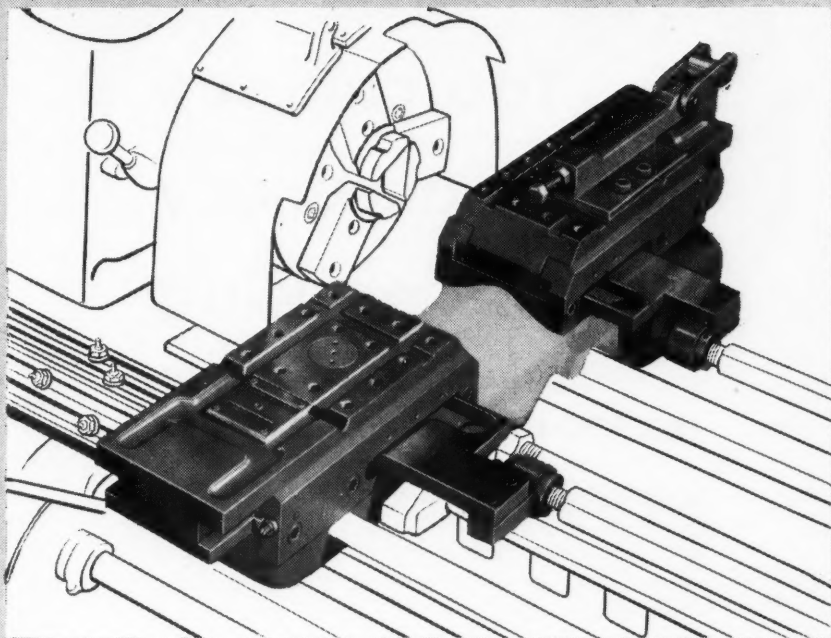
For practical recommendations submit your problems to Hanson-Whitney engineers.

**PIONEERS OF FINISHED TAPS**

4HW48

# GISHOLT FASTERMATICS

(Automatic Turret Lathes)



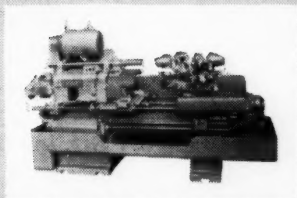
Separate front and rear cross-slides permit independent or simultaneous operation . . . providing utmost flexibility in tooling setups . . . **GREATER PRODUCTION\***

## GISHOLT MACHINE COMPANY

Madison 10, Wis.



THE GISHOLT ROUND TABLE represents the collective experience of specialists in machining, surface-finishing and balancing of round or partly round parts. Your problems are welcomed here.



\* Each of the Fastermatic's independent cross-slides can be used as many times as necessary within the turret cycle. Thus, you can do more different jobs.

TURRET LATHES • AUTOMATIC LATHES  
SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

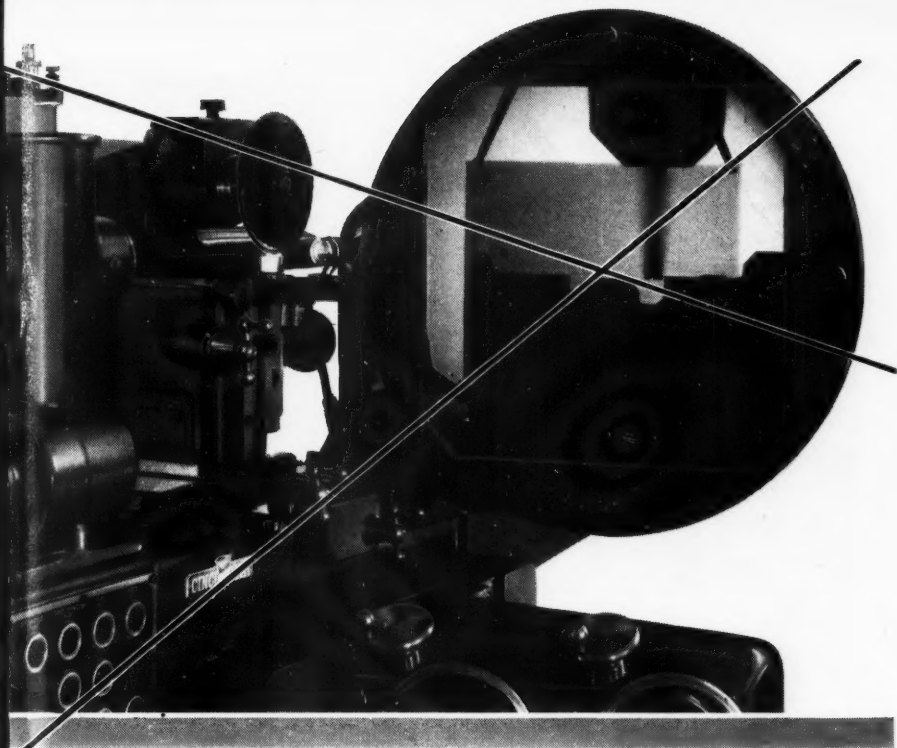
# **You can see accuracy in the making**

## **ON THE NEW CINCINNATI PROJECTO-FORM GRINDING MACHINE**

Like television, the new CINCINNATI Projecto-Form Grinding Machine eliminates a lot of intermediate steps and shows you what's actually happening at the point of action. And it goes one step further . . . it enlarges the original object 20 times. ¶Through an arrangement of lenses and a mirror, an intense light projects a silhouette of the work and wheel to a ground glass screen in front of which the operator is seated. A "drawing" of the desired contour, twenty times size, is cut on a glass plate coated with a tinted translucent emulsion. Mounted on the viewing screen, the drawing furnishes a guide to which the operator works. With his two hands on small micrometer adjusting handwheels, he adjusts the wheel vertically and transversely while it is reciprocating over the work. Grinding continues until the image of the work matches the drawing. You may obtain complete specifications by writing for catalog M-1612.

CINCINNATI  
Stand  
Speci  
Stand  
Maxim  
Comp

THE



**CINCINNATI Projecto-Form Grinding Machine**

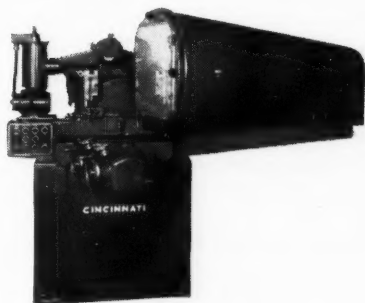
Standard projection lens..... 20X

Special projection lens..... 40X

Standard width of grind, one setting.... .9"

Maximum longitudinal adjustment..... 4½"

Complete specifications in catalog M-1612



**THE CINCINNATI MILLING MACHINE CO.**

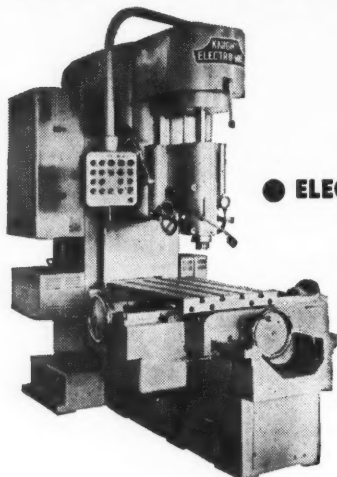
CINCINNATI 9, OHIO, U. S. A.

MILLING MACHINES - CUTTER GRINDING MACHINES

# ***NEW!***

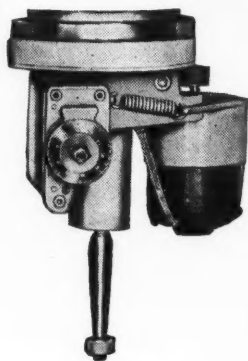
## **KNIGHT EQUIPMENT**

**... to Boost Output  
and Lower Costs**



● **ELECTROMILL**

Efficiently, economically handles large capacity work of many types: jigs, metal patterns, multi-cavity molds, jig boring with dial indicator, drilling, milling, machining light metals, etc. Infinitely variable range of speeds and feeds. Any combination of speeds and feed controls can be supplied or eliminated subject to customers requirements.



● **HOLE GRINDING  
ATTACHMENT**

Accurately and quickly finishes holes and bores up to 6" diameter in hardened parts. Simplifies handling work too large to swing in standard machines. Special adaptors permit easy installation on any milling machine.

*Write Today*  
for details and  
specifications



# **W. B. KNIGHT**

**MACHINERY COMPANY**

**MORE GOODS for MORE PEOPLE at LOWER COST**

**3920 WEST PINE BLVD. • ST. LOUIS 8, MISSOURI**





# 50% to 100% More Gears per Cutter with **SUPERITE** *The POST TREATMENT FOR HIGH-SPEED STEEL*

**— at no extra cutter cost**



**99%**  
**INCREASE IN  
CUTTER LIFE**



**64.9%**  
**INCREASE IN  
CUTTER LIFE**



**110%**  
**INCREASE IN  
CUTTER LIFE**

Actual performance tests of "SUPERITE"-Treated Cutters in customers' plants are shown in the accompanying figures.

"SUPERITE"-Treated Cutters represent a substantial saving in that they produce a greater number of gears per sharpening, and per total cutter life . . . resulting in an overall saving of productive machine time.

The process is exclusive with Fellows, performed only at our plant in Springfield, Vermont. Arrangements can be made, however, for cutting tests in your plant. Contact our nearest office.

# *Fellows*

The Fellows Gear Shaper Co., Head Office and Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Building, Detroit 2; 640 West Town Office Building, Chicago 12; 7706 Empire State Building, New York 1.



## PLUS FEATURES MEAN LOWER COSTS

### for precision toolroom and production grinding

The plus features of Landis Tool grinders make them the finest cost cutting tools of their kind.

Plus features that contribute to lower precision grinding costs are: A continuously adjustable speed motor driven headstock that permits you to select quickly and easily the best operating speed. Hydraulic traverse, hydraulic automatic wheel feed, conveniently grouped operating controls. Investigate Landis Tool features for your requirements.

#### 10" x 24" Type CH Hydraulic Universal (Catalog I-45)

Work Swing	10 $\frac{3}{4}$ "	Work Speeds	55 495 R.P.M.
Taper max.	2"/ft.	Floor space	60 $\frac{1}{2}$ " x 106"
Wheel size	12"	Net weight	5700 lbs.

Help for your grinding operators—send for free illustrated book "Better Grinding."  
World's Largest Manufacturer of Precision Grinders Exclusively.

**LANDIS TOOL**  
*Precision Grinders*

**LANDIS TOOL COMPANY, 16 EAST 6TH ST., WAYNESBORO, PENNA.**

# **Firth Sterling**<sup>®</sup> *High-Speed Toolholder Bits*



*"Help yourself to Quality"* AND GET THE BEST.

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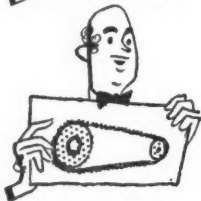
Foreman: "Ferdinand's tickled pink since we switched from the old set-up wheels to these Armour Abrasive Belts!"

## 3 REASONS WHY ARMOUR BACKSTAND BELTS ARE BETTER!



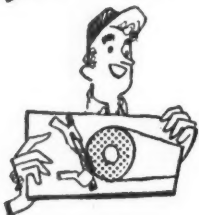
### 1. Sharper Coating!

**Ferdinand:** "Take it from me—I've worked with both the old set-up wheels and these Armour Coated Abrasive backstand belts. And since we converted our bench grinders into belt grinders by using backstand units—we've had sharper, tougher, smoother cutting action. That's because factory-coated belts have uniform grain distribution. It was the inaccurate, uneven coating of the set-up wheel which slowed down cutting action."



### 2. Cooler Cutting!!

**Foreman:** "Right, Ferdy! We know, too, that belts afford greatly increased production because their cutting surface is greater. The point of contact on the belt gets a chance to cool as it passes around the idler. Results—cooler cutting, longer abrasive life, less tendency to burn work."



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**Ferdinand:** "And with the resilient contact wheel you get a cushioned grind and greatly increased contact area. This cushioned grind gives us smoother, cleaner finishes—in less time, at lower costs—even on the surfaces that are hardest to reach. To us operators that means less fatigue—and my friend, the Foreman, knows that it also means more speed and greater production."

For abrasive advice—consult your Local Armour Industrial Distributor

**ARMOUR and Company**



*Coated Abrasives Division*

1355 WEST 31st STREET • CHICAGO 9, ILLINOIS

A light radial  
has been added  
to the  
**FOSDICK  
LINE**



● This recent addition to the Fosdick line meets the need of industry for a light Radial. This machine is similar to the Fosdick standard line of radial drills.

The arm is raised and lowered by an electric motor—the raising, lowering and clamping of the arm is electrically interlocked—A single lever is used to control all of the above functions. An electric column clamp is standard equipment and is operated by means of a push button.

A new column design replaces the conventional split column type which uses a sliding shoe fitted into the column. This shoe applies pressure to the inner column, locking the inner column rigidly to the outer column, and preventing any side movement of outer column with reference to inner column.

The head of simple design provides nine speeds and four feeds. The feed clutch and quick return mechanism are of entirely new design and feed is adjustable from the outside.

**For complete detailed construction  
write for FOSDICK 3'-4'-5'-11"  
column bulletin R.D.M.S.**

**FOSDICK**

**MACHINE TOOL CO.**  
CINCINNATI 23, OHIO



FOR LOWER MANUFACTURING COSTS

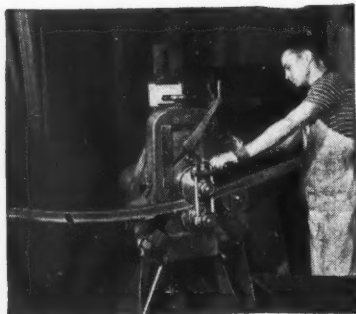
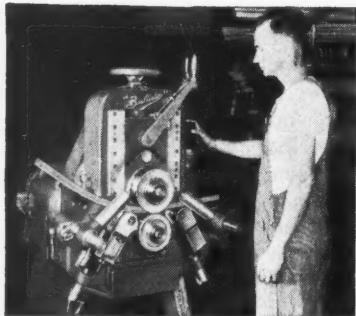
BENDING OUTPUT

*Skyrockets*



with

**"BUFFALO"  
BENDING  
ROLLS**



Above: "Buffalo" Aircraft Type Bending Rolls in operation.

IF you bend metal on a production basis, your quickest, cheapest and most accurate way is with a "Buffalo" Bending Roll—as hundreds of shop men have found. It's easy for inexperienced operators to turn out spirals, arcs, segments from angles, tees, rounds, flats, etc., with "Buffalo" Bending Rolls—sizes and types for every need. Why not let us help you speed up your bending? Simply write:

- ★ BACK SPOT FACERS
- ★ BAR CUTTERS
- ★ BENDING ROLLS
- ★ BILLET SHEARS
- ★ DOUBLE END PUNCHES AND SHEARS
- ★ LOCOMOTIVE SHEARS
- ★ MILL TYPE SHEARS
- ★ RAPID ACTING PUNCHES
- ★ SINGLE END SHEARS
- ★ SPRUE CUTTERS
- ★ STRUCTURAL IRON WORKERS
- ★ UNIVERSAL IRON WORKERS
- ★ DRILLS FOR THE PRODUCTION LINE—DRILLS FOR THE TOOL ROOM

**BUFFALO FORGE  
COMPANY**

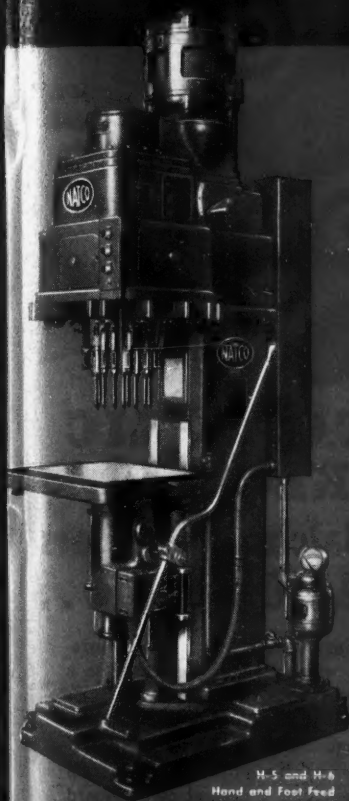
388 BROADWAY

BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

CONTINUOUS SERVICE—FASTER OPERATION—PEAK ACCURACY

# H-5 and H-6 High Speed Multi Drillers and Tappers



H-5 and H-6  
Hand and Foot Feed

Available in Standard  
or Heavy Duty Models  
for work in small  
or medium sized parts



*\* In Cast Iron*



*\* In Wood*



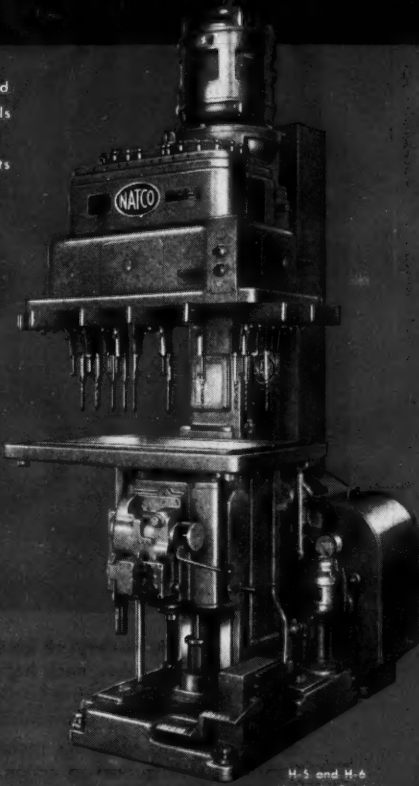
*\* In Steel*



*\* In Plastics*



*\* In Aluminum*



H-5 and H-6  
Hydraulic Feed

NATCO H-5 and H-6 Standard and Heavy Duty Multiple Spindle Drillers and Tappers make possible sensitive, high speed drilling and tapping in a wide range of materials at low cost. Features are the multiple spindle head, large working surface, quick change gears and speeds, vertical adjustment on spindles, and reversing motor drive. Available with hydraulic or hand and foot feed. Air operated rotary table available extra. Check details on these machines. Write for Bulletin 248.

\*WRITE FOR ACTUAL PRODUCTION FIGURES ON THESE PARTS

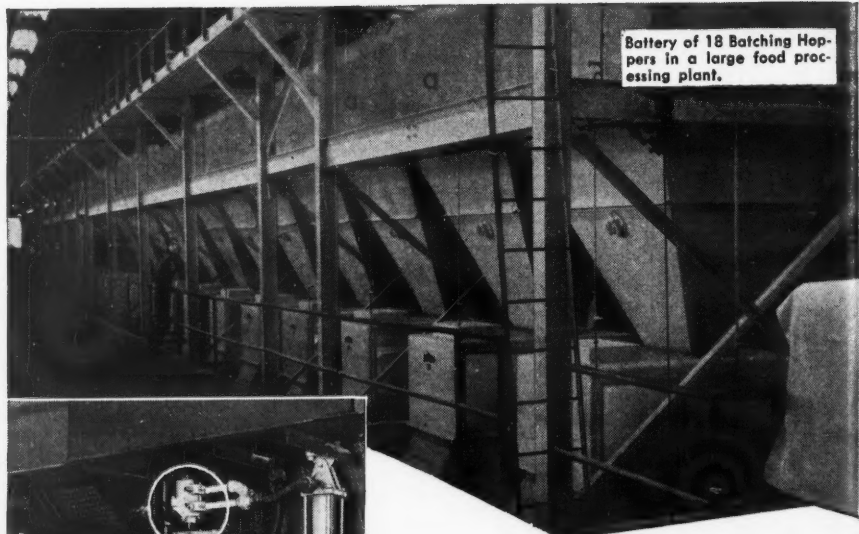
NATCO DRILLING, BORING, TAPPING  
AND FACING MACHINES

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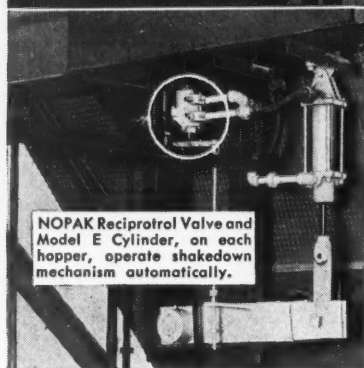


NATIONAL AUTOMATIC TOOL COMPANY, INC., Richmond, Ind., U. S. A.  
Branch Offices: 1809 Engineering Bldg., Chicago • 409 New Center Bldg.,  
Detroit • 1807 Elmwood Ave., Buffalo • 2902 Commerce Bldg., New York City

*Call a Natco Field Engineer*



Battery of 18 Batching Hoppers in a large food processing plant.



NOPAK Reciprotrol Valve and Model E Cylinder, on each hopper, operate shakedown mechanism automatically.

## **AUTOMATIC "SHAKE-DOWN" for 18 Batching Hoppers is NOPAK Operated . . .**

This block-long battery of hoppers is used for measured mixing of product ingredients. Running thru each hopper is a rotating shaft, with paddles, connected to a NOPAK Model E Hydraulic Cylinder. As the cylinder reciprocates, the paddles shake down the dry ingredients which drop into glass-enclosed weighing batchers. Each of the 18 cylinders reciprocates 20 times per minute, 18 hours a day. This continuous reciprocating action is governed by 18 NOPAK Reciprotrol Valves. The entire mixing process is fully automatic . . . controlled from a central switchboard by 2 operators.

NOPAK Reciprotrol Valves can help you achieve automatic control of cylinder action in your plant, or in your product. Write for Illustrated Bulletin.

**GALLAND-HENNING MFG. CO., 2758 S. 31st Street, Milwaukee 7, Wis.**

**Representatives  
in Principal  
Cities**

# **NOPAK**

## **VALVES AND CYLINDERS**

**DESIGNED for AIR and HYDRAULIC SERVICE**

A 5410-1/2I

"Since installation the 2 1/4" Bar Automatic has been operating on two shifts machining short runs. Setup time for complete changeover is only three to five hours. **PRODUCTION HAS INCREASED 40% OVER ESTIMATED FIGURES** quoted when the machine was installed."

Stainless Engineering & Machine Works Div.  
Cooper Alloy Foundry Co.  
Hillside, New Jersey

"We are very well pleased with the 5-Spindle Bar Automatic. Production has greatly increased. **SCRAP LOSS IS EXCEPTIONALLY LOW.**"

The Warren Webster Co.  
Camden, New Jersey

"Our battery of five Warner & Swasey Automatics **HAS EFFECTIVELY CUT COSTS** and, after approximately a year of actual production a program involving several more of these machines is being planned."

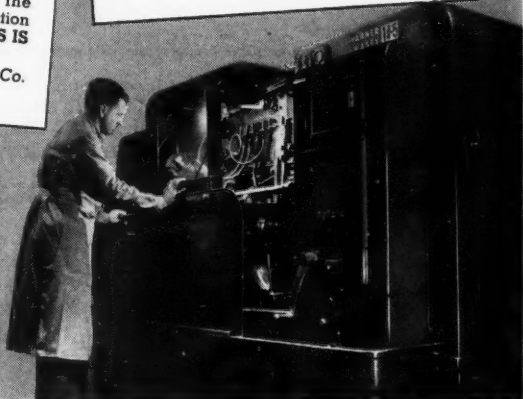
Colson Corporation  
Elyria, Ohio

"We recently purchased a new Warner & Swasey 5-Spindle Automatic Bar Machine for contract work. This machine, without question, **EXCELS IN ACCURACY** and, since it is a camless machine, can be set up in a minimum amount of time."

The Kneisley Electric Co.  
Toledo, Ohio

"Production reports show that our Warner & Swasey 5-Spindle Automatic Bar Machine is **A PROFITABLE INVESTMENT** for us. Results are so gratifying that the purchase of another is contemplated."

The Coffing Hoist Co.  
Danville, Illinois



**YES, MANAGEMENT APPROVES THE NEW**

## Warner & Swasey *Camless* Automatics

**M**ANUFACTURERS appreciate the savings made by eliminating expensive cam inventories . . . reducing costly setup time.

The patented "Quick-Set" mechanism—exclusive with these automatics—does away with stocking and changing cams . . . makes short, medium and long runs all profitable on one machine.

Greater precision is obtained with radically new "shockless" spindle indexing.

And operators prefer the unobstructed, safer working stations, with better visibility, greater chip clearance and easier access to tools and work.

Full information on these new machine tools will show you how their many new features and design improvements can cut costs, boost production in your shop . . . Ask your nearest Warner & Swasey office for full particulars or write to Warner & Swasey, Cleveland 3, Ohio.

**5-SPINDLE BAR MACHINES**  
—1 1/4" STANDARD CAPACITY  
—2 1/4" OVERSIZE CAPACITY  
**5-SPINDLE CHUCKING MACHINE**  
—6" SWING



*You can machine it better, faster, for less... with a Warner & Swasey*

TURBINE LATHES, MULTIPLE AND SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

**PICK THIS BLADE**



**for Flexibility plus Toughness**

The improved, better cutting NEW GRIFFIN is a hand frame blade that is unique. Through the center its temper is soft but very tough. Its back and teeth are hard. Only Griffin makes this type of blade—your best buy for all general hand saw use.

### OTHER GRIFFIN BEST BUYS

For greater economy in production power sawing pick the long-lasting GRIFFIN SPECIAL ALLOY molybdenum high speed steel blade; hand sizes also.

For cleaner, more accurate cutting of hard alloy steels pick the GRIFFIN HIGH SPEED STEEL blade; 18-4-1 tungsten; power and hand sizes.

For hand-sawing thin sheet, tubing, conduit, etc. without tooth breakage pick the GRIFFIN NON-STRIP.

For precision contour sawing pick a GRIFFIN BAND SAW; choice of Hard-edge-flexible back, Spring-temper, Skip-tooth and Wood-sawing types.

For latest Griffin Price list giving full descriptions, sizes, weights, useful selection tables write to—

**JOHN H. GRAHAM & CO., Inc.**

General Sales Agent

Dept. D, 105 Duane St.

New York 8, N. Y.

ASK YOUR DISTRIBUTOR FOR

**• GRIFFIN •**



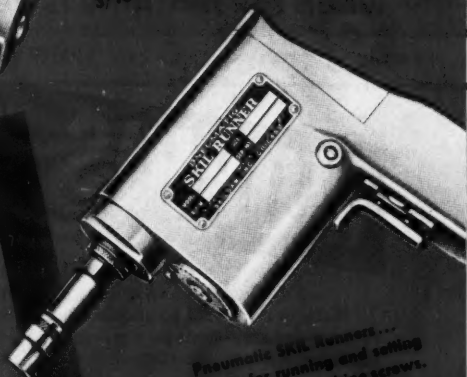
**HACK SAW BLADES and BAND SAWS**

Made by G. W. GRIFFIN CO., Franklin, N. H., Hack and Coping Saw Blade Specialists since 1880





Pneumatic SKIL Drills...  
made in 7 speeds...capacity  
3/16" - 1/4" - 5/16"



Pneumatic SKIL Blowers...  
3 models for running and setting  
of 1/4" or 3/16" machine screws.



Pneumatic SKIL Drivers...  
3 models ... for driving  
screws size No. 14 wood,  
14" machine, No. 12 wood  
or machine, No. 10 wood or  
machine screws.



Pneumatic SKIL Hammers...  
3 sizes, 4 models in each...  
capacity 1/8" to 1/4"  
cold rivets.



Pneumatic SKIL Grinders...  
... 3 models ... used as  
production grinders or  
grinding files.

# Wherever the Power is AIR ... PNEUMATIC SKIL Tools

can speed the work ... cut your  
costs on countless production  
and assembly jobs

Pneumatic SKIL Tools have everything ... fine  
engineering and design ... compactness and light  
weight for exceptional handling ease on day-long  
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for quieter operation ... real SKIL Tool quality  
throughout for long-run economy. See your SKIL  
Tool Distributor today about a demonstration.

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ELECTRIC  
**SKIL Tools**  
PNEUMATIC

**It's much easier to get more production  
when the machine is designed for it . . .**

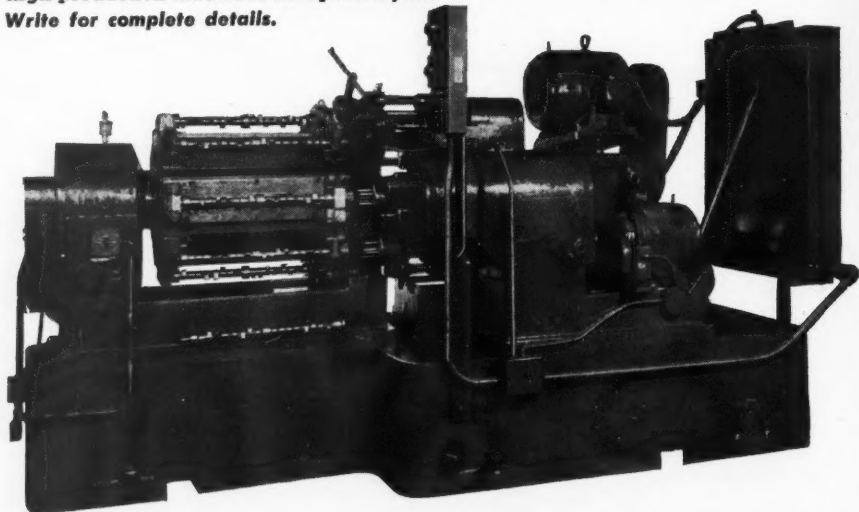
# **MORRIS** WILL BUILD THE MACHINE TO FIT YOUR JOB

When you are confronted with the problem of reducing costs to meet competitive figures on mass production work, you most often find the only answer in a machine designed and built to handle a specific job. Here is a typical example of just that. This Morris Mor-Speed Machine is designed to drill—ream—counterbore and tap four holes in the flange of an automobile camshaft on a mass production basis.

It has eight stations—indexing is automatic as are all other functions of the machine except loading—unloading and clamping the work by hand. This hand operation is accomplished while the tools are working on the other seven pieces of work. There is no lost time and you get a finished piece at each index of the machine.

If you have a job which requires high production consult Morris. They have the engineering "know-how"—experience and facilities to design, develop and build high production machines for specific jobs.

**Write for complete details.**

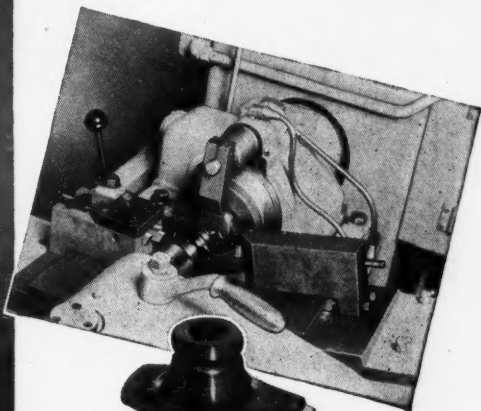
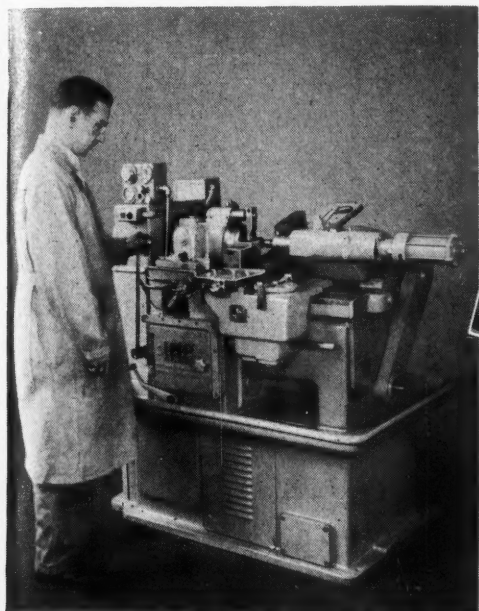


## **The MORRIS Machine Tool Co.**

CINCINNATI 3, OHIO

# MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



*Lo-swing* IMP

## TURNS AND GROOVES DISTRIBUTOR ROTORS WITH SPEED AND ACCURACY

**Problem:** To turn contact ring, distributor points and locking ring groove on Distributor Rotors. All machined surfaces must be concentric with the taper bore and have a fine, smooth finish.

**Solution:** The Lo-swing IMP Automatic Lathe was selected for this job because its design and construction provide the necessary speed, productive capacity and close accuracy demanded.

The Distributor Rotor is mounted on a special arbor which is accurately fitted to the headstock spindle bore, and prevented from working loose by a suitable locking bolt. The small end of the arbor is supported by a revolving tailstock center carrying a hardened and ground bushing which maintains a constant pressure on the end of the work piece, preventing any end play.

The contact ring and the distributor points are turned with three cemented carbide tools mounted on the front slide, while the ring groove is formed with a similar type tool mounted on the rear slide. The turning tools are properly spaced so that the intermittent cutting on the distributor points will not mark the contact ring. At the completion of the machine cycle, the operator throws an air valve, relieving the tailstock center and also actuating the work stripper arm located just over the headstock spindle.

The machine cycle is extremely fast and the operator's work is reduced to the strict minimum of loading the parts on the arbor and pushing the starting lever.

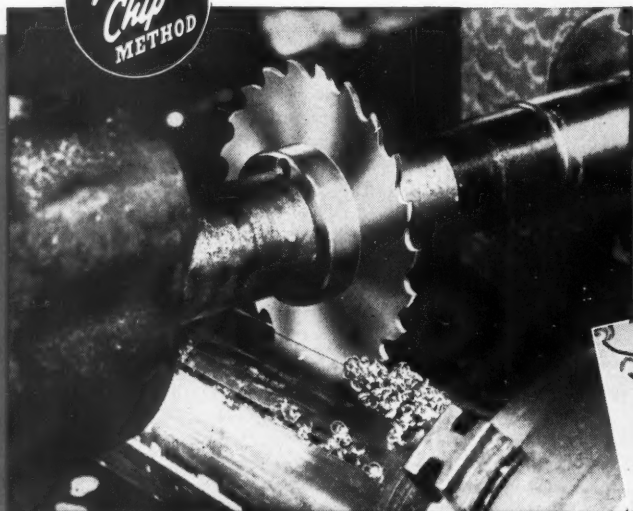
Consult our Engineering Department for full information regarding time and other saving equipment.

**SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.**

PRODUCTION COSTS ARE LOWER WITH SENECA FALLS MACHINES

# BREAK UP *Your Chip Loads.*

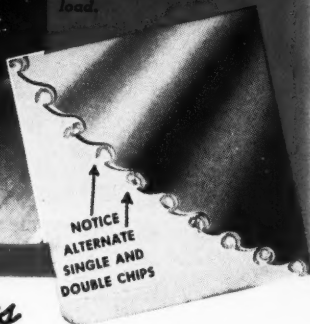
## CASH IN ON FASTER FEEDS AND SPEEDS!



The M. & M. Hi-Lo principle provides alternate high and low teeth which form single wide and double narrow chips, respectively, dividing the load.

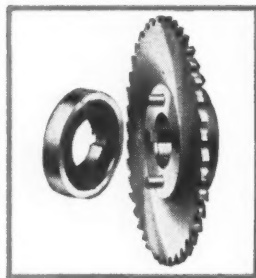
"HI-LO"  
PRINCIPLE

RESULT—  
TRIPLE  
CHIP



### MOTCH & MERRYWEATHER *Slitting Saws*

## GIVE GREATER SPEEDS AND LONGER TOOL LIFE

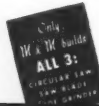


Motch & Merryweather's original dual drive equalizes stresses, gives plenty of driving power, and makes blade keyways unnecessary.

M. & M. Slitting Saw Blades enable you to profit from record-breaking speeds and satisfying accuracy. They give you all the well known advantages of the Triple-Chip Method. The characteristic M. & M. curved, cam-generated tooth contour avoids clogging, since the curling chips are self-clearing. A generous gullet imparts great strength to the teeth. Result: faster cutting, longer blade service.

Exclusive dual drive design supplies positive driving power and protects the driving means; practically no blade breakage. Blades adaptable to arbors up to 1 1/4"; interchangeability conserves blade investment. Range of pitch in all diameters and thicknesses: Other big advantages, too.

Get well illustrated Bulletin "D-6"



THE MOTCH & MERRYWEATHER MACHINERY CO.  
PENTON BUILDING CLEVELAND 13, OHIO



ANOTHER *Plus* FEATURE OF THE *New* RIVETT 918 "STEELWAY" CABINET LATHE

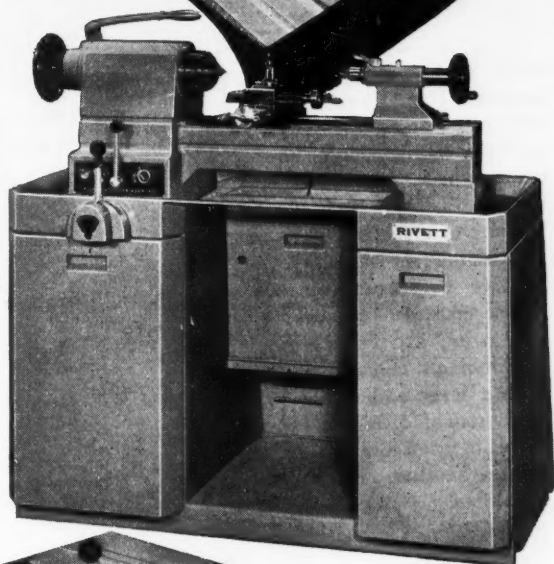
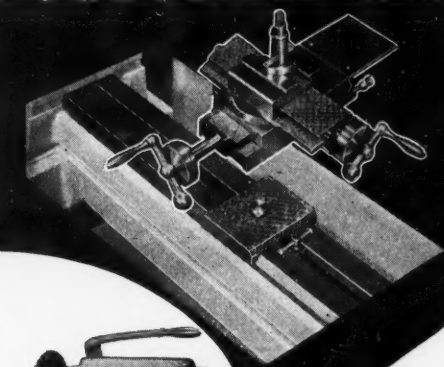
**SELF-  
ALIGNING  
SLIDE  
REST**

On most bench or cabinet type lathes, the compound slide rest aligns against the front narrow edge of the bedway. Such alignment is not automatic or fool-proof but depends entirely upon the operator. This type of mounting also makes it difficult to change the lateral position of the slide rest on the bed.

The compound slide rest of the Rivett 918 "Steelway" cabinet lathe mounts in any lateral position on a self-aligning shoe. Beveled edges of the shoe automatically square the slide rest with line of centers. The ability to position laterally is valuable on facing large diameters. Hardened and ground feed screws with large 2" diameter dials add to the precision of the lathe.

*No other lathe has  
comparable slide rest  
features.*

WRITE FOR BULLETIN 918SL



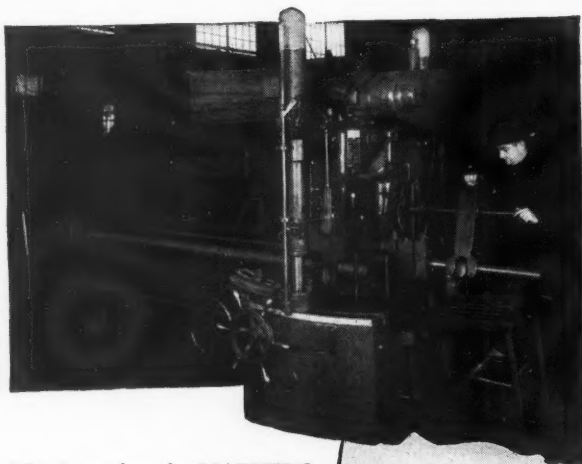
**SPINDLE SPEED SELECTION**

Correct spindle speed for any operation. Control lever affords any speed ranges from 120 to 2800 or 180 to 3750 r.p.m. Selected speed shows on dial.

**RIVETT**

**RIVETT LATHE & GRINDER, INC.**

BRIGHTON • BOSTON • MASSACHUSETTS • U. S. A.

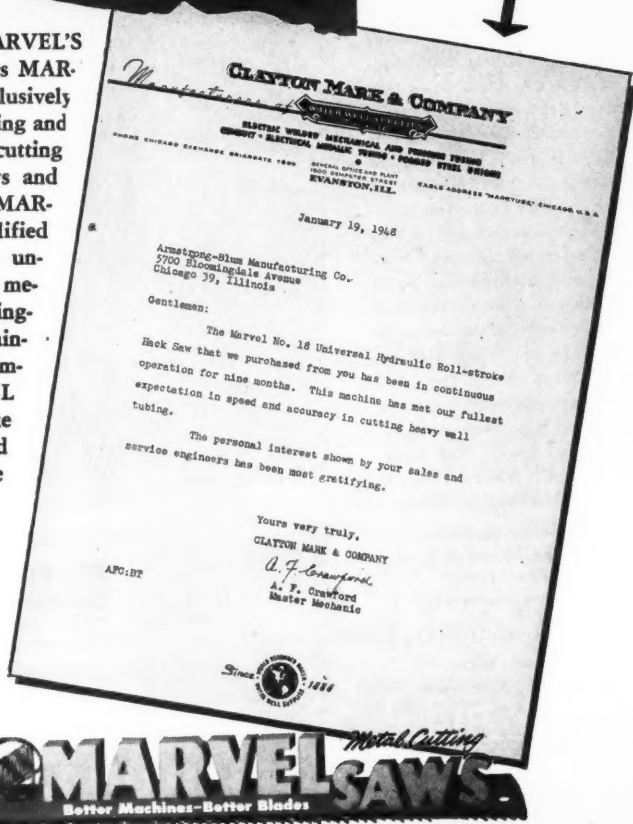


You can depend  
on MARVEL'S 53  
years of leader-  
ship in both per-  
formance and  
service.

Metal sawing is MARVEL'S business. For 53 years MARVEL has worked exclusively on designing, developing and building better metal cutting band saws, hack saws and blades. As a result, MARVEL is uniquely qualified to give expert and unbiased analysis of all metal sawing and cutting-off problems, and maintains a large and competent staff of MARVEL Field Engineers to make this service always and immediately available to you.

Write for Catalog  
C-48; contains a  
volume of metal  
sawing  
information.

ARMSTRONG-BLUM  
MFG. COMPANY  
5700 Bloomingdale  
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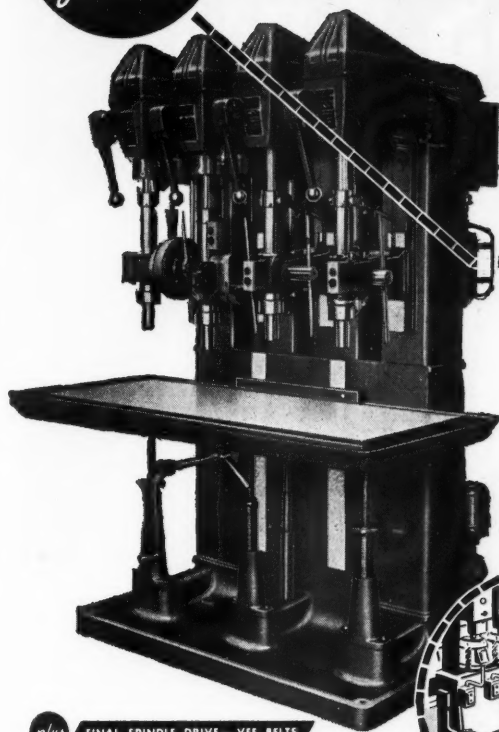




**Avey's**  
**PLUS**  
*features*

## add up to **TOP PRODUCTION**

Each spindle of AVEY BMA-6 is individually motor-driven by standard frame constant speed motor. Foot-mounted motor easily interchanged or replaced. Standard motors can be stocked.



### AVEY TYPE BMA-6

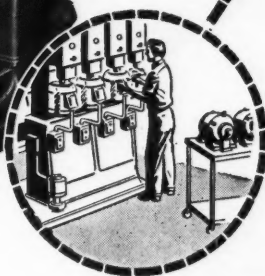
Four Spindle—12" Overhang

1st spindle—Avey-matic feed

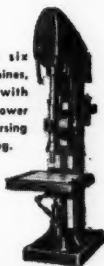
2nd spindle—Plain power feed

3rd spindle—Hand feed

4th spindle—Tapping (reversing motor)



Single to six spindle machines, equipped with hand feed, power feed or reversing motor tapping.



*plus*

#### FINAL SPINDLE DRIVE—VEE BELTS

Vee belt used on final drive from gear box to spindle. Increases speed and sensitivity in drilling. Carries full horse power from motor to job.

*plus*

#### SIX SPEED CHANGES

On the AVEY BMA-6 six speed changes are made through selective, sliding gears. This automatic type of gear shift is controlled by a single lever at front of machine. Provides versatility and effective operation.

*plus*

#### SPEEDS OBTAINED—SLIDING GEARS

Selective, sliding gears of AVEY BMA-6 change speeds quickly and easily. Each gear is manufactured and finished by accurate, modern process, shaved, hardened and lapped. Insures smooth operation and long performance.

CLIP AND MAIL TODAY

**Avey** DRILLING MACHINES  
CINCINNATI, OHIO

AVEY DRILLING MACHINE CO.,  
CINCINNATI 1, OHIO

4

Gentlemen: Please send without obligation your new Bulletin 647.

COMPANY \_\_\_\_\_

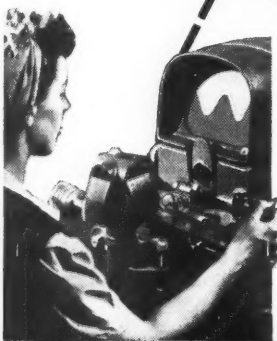
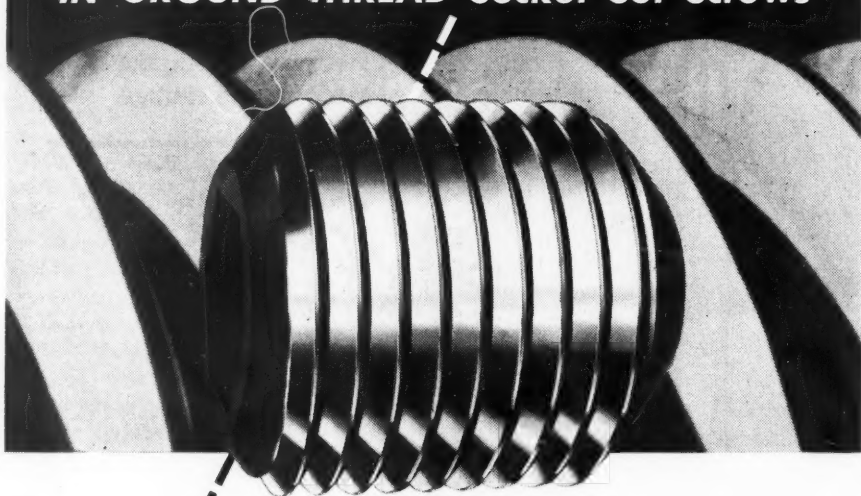
ADDRESS \_\_\_\_\_

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You're O.K. with P-K for Dependable

# CLASS 3 FIT

IN GROUND THREAD Socket Set Screws



THE COMPARATOR, used in inspecting every lot of P-K Ground Thread Socket Set Screws, clearly shows why you can be sure of uniform, dependable Class 3 Fit. Threads are ground on hardened blanks, by the first successful quantity production thread grinding process, with many advantages offered first in Socket Set Screws by Parker-Kalon.

Free from hardening distortion,

mirror smooth, they have none of the nicks, burrs and other imperfections common to cut threads.

SEE AND FEEL THE DIFFERENCE! Ask for samples. See why P-K Ground Thread Socket Set Screws are years ahead by every test . . . why they'll put your product out in front—assembly-wise and sales-wise. Parker-Kalon Corp., 200 Varick St., New York 14,

Available for Prompt Delivery

**PARKER-KALON** **GOLD-FORGED** **SOCKET SCREWS**

SOLD ONLY THROUGH

ACCREDITED DISTRIBUTORS



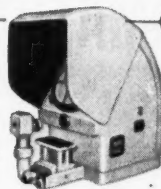
# Four more to choose from

The New Jones & Lamson BC-14 Bench Optical Comparator, with 14" diameter screen, offers you a choice of four different table assembly combinations. This enables you to choose the model best suited to your needs, and obtain... **AT LOWEST COST... THE FINEST IN OPTICAL COMPARATORS.**

These models provide a larger lens field and a larger screen area than the smaller bench models. They are designed to cover an almost unlimited range of inspection work—they provide a means of inspection that is accurate, rapid and economical. Costly gages can be dispensed with, costly time saved and quality improved.

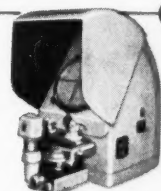
Many components and products formerly inspected by slow, tedious methods that retarded production and drained profits, are now inspected in a matter of seconds or minutes on Jones & Lamson Comparators, with consequent savings all along the line.

Our engineers are inspection specialists; their knowledge of holding fixtures, handling methods and suitable Comparator equipment, qualify them to study your inspection problems and make recommendations that will improve your profit picture. They have for others. Call, write or wire for their service today.



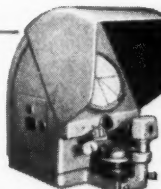
**Model BC-14A**

This model has a platform type table 5 x 10" for inspecting, by comparison, a large variety of objects on a production basis. The top of the table is 5" below the center of the lens system to provide ample space for various work holding fixtures. Magnifications range from 10 to 100.



**Model BC-14S**

This model has a 16" table that can be compounded for inspecting objects with helices. The table can be elevated vertically 1 3/4". It is used for inspection, by comparison, of screw threads or other irregular profiles. Objects up to 3" diameter and 11" long between centers can be inspected at magnifications ranging from 10 to 100.



**Model BC-14C**

This model has a 16" table with 2" lateral travel that can be compounded for inspecting objects with helices. The table can be elevated vertically 1 3/4". Objects up to 3" diameter and 11" long between centers can be inspected at magnifications ranging from 10 to 100.



**Model BC-14D**

This model is used for the complete measurement of tools, gages and products. The 16" table with 2" lateral travel can be compounded for inspecting objects with helices. It can be elevated vertically 1 3/4". The chart ring is graduated in degrees and minutes and the hand-wheel is graduated in .0001". Objects up to 3" diameter and 11" long between centers can be inspected at magnifications ranging from 10 to 100.



## Jones & Lamson

### OPTICAL COMPARATORS

**JONES & LAMSON MACHINE COMPANY**  
Springfield, Vermont, U. S. A.

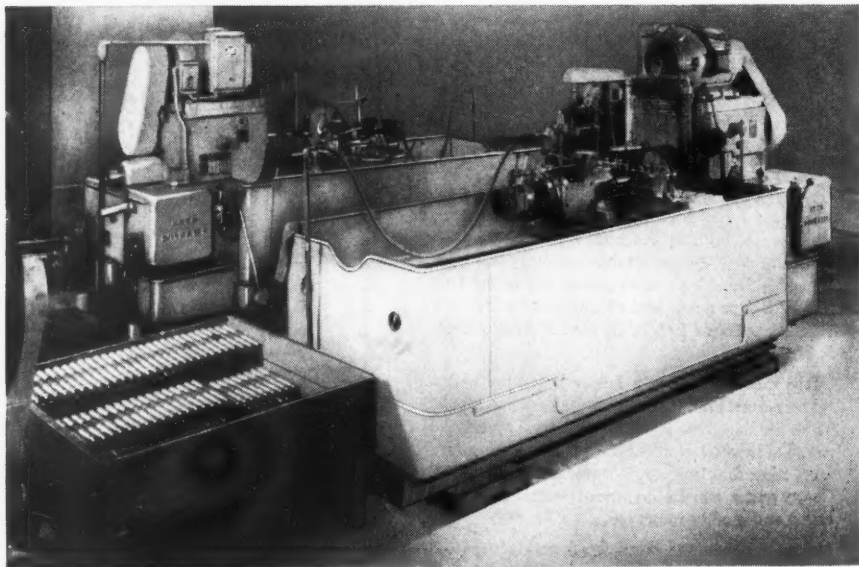
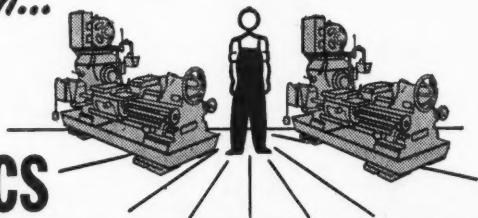
Manufacturers of: Universal Turret Lathes • Pay Automatic Lathes • Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Flat Rolling Dies

*75% Greater Production...*

**ONE-MAN**

**OPERATES**

**TWO DUOMATICS**



The J. I. Case Company, famed farm equipment manufacturers, cites a specific production run of several jobs performed on its Lodge & Shipley Duomatic Lathes to prove this statement. In producing  $1\frac{1}{8}$ " diameter snapping roll shafts for Case's famous corn picker, two Duomatics are used. Operated by one man, these automatic lathes turn and face cold rolled bar stock to ".002" tolerance" at a production rate "75% greater" than former lathes!

Such records are commonplace with Lodge & Shipley's famous Duomatics . . . 2A or 3A models. Lodge & Shipley Engineers will gladly show you other case histories of 2-A Duomatics (for smaller work) and 3-A Duomatics (for larger jobs). They will prove that Duomatics can do your repetitive jobs . . . far faster . . . with more profit.

THE **Lodge & Shipley** COMPANY

CINCINNATI 25, OHIO

MACHINE TOOL DIVISION • 3055 COLERAIN

SPECIAL PRODUCTS DIVISION • 800 EVANS ST.

# GEMCO

## MULTI-PURPOSE SHAPERS *are the* LEADERS

★ for RUGGEDNESS

★ for PRECISION

★ for ADAPTABILITY

IN SIZES from  
16" to 36" incl.

GEMCO Multi-Purpose Shapers provide simultaneously a ruggedness for deep hogging cuts, yet produce to close tolerances for all finishing cuts...an efficiency not often found in ONE Shaper.

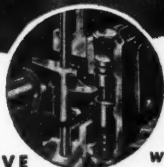
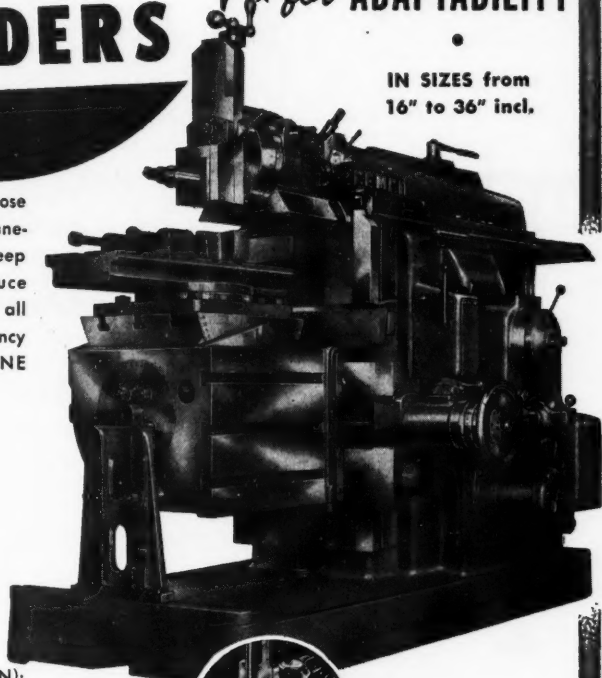
### 3 MODELS... PLAIN PRODUCTION and UNIVERSAL

There's a GEMCO Shaper for every machine shop need...for average shop work (PLAIN); for heavy production work (PRODUCTION); for tool and die work, etc. (UNIVERSAL).

THE SHAPERS WITH THE EXCLUSIVE  
LUBRIGARD SAFETY DEVICE

**GENERAL ENGINEERING & MFG. CO.**

ST. LOUIS 16, MISSOURI



WRITE TODAY  
FOR BULLETIN  
GC-135



MAFR. OF  
PRECISION  
MACHINERY  
SINCE 1917

**SAVE** on your  
**HEAT TREATING COSTS**  
*in your own plant!*



**HARDEN and TEMPER TOOLS • DIES**

**EFFICIENTLY • ECONOMICALLY**

Now you can save money by heat treating your small parts, tools and dies in Sentry Electric Furnaces. Used with Sentry Diamond Blocks, the scientifically controlled neutral atmosphere will produce full hardness and uniformity of work with no reduction in size, no scale and no decarburization.

Easy to install, simple to operate, these Sentry Furnaces will quality harden any type of high speed or high carbon high chromium steel tools or dies at low production cost even with inexperienced help. For tool or production line, there is a Sentry Furnace to meet your particular requirement.

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descriptive  
catalog  
1054-L.*



**The Sentry Company**

**FOXBORO, MASS., U. S. A.**





You need this New **POPE** SPINDLE CATALOG  
if you do any grinding, boring or milling

**POPE**  
Series P-2500  
Heavy Duty Motorized  
SPINDLES

CATALOG NO. 58

**POPE** POPE MACHINERY CORPORATION  
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12

TECHNICAL SHEET FOR TAPERED NOSE SPINDLE  
SIZES: 1/2" - 1" DIA. NOSE SPINDLES OF SAME RATED HP SEE PAGE NO. 12  
P. - 900 RPM Style No. P-2503 1 1/2" H.P. - 1800 RPM  
P. - 1200 RPM Style No. P-2504 3 H.P. - 3600 RPM  
PAGE NO. 1. FULL ORDERING INFORMATION ON PAGE NOS. 2, 3 & 4  
ORDER BY STYLE NUMBER

RELATIONSHIP DIAGRAM ON PAGE NO. 37  
SEE HOLDERS ON PAGES 47, 48 & 49

STYLE NUMBER	HP	RPM	FACE
2503	1 1/2	1800	19
2504	3	3600	13
2505	3	3600	14
2506	3	3600	15
2507	3	3600	16
2508	3	3600	17
2509	3	3600	18
2510	3	3600	19
2511	3	3600	20
2512	3	3600	21
2513	3	3600	22
2514	3	3600	23
2515	3	3600	24
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2561	3	3600	70
2562	3	3600	71
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2564	3	3600	73
2565	3	3600	74
2566	3	3600	75
2567	3	3600	76
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2584	3	3600	93
2585	3	3600	94
2586	3	3600	95
2587	3	3600	96
2588	3	3600	97
2589	3	3600	98
2590	3	3600	99
2591	3	3600	100

Here, under one cover, is *all* the data for quick, positive selection of the one best heavy duty, precision, Motorized Spindle and matching Wheel Holder or Cutter Head for your work.

POPE Heavy Duty P-2500 Series Spindles with Sealed-in Lubrication are available from 1/4 to 20 HP (special Spindles up to 75 HP), 900 to 3600 RPM.

It took months of engineering to develop this ready reference Catalog. It's all yours — to save your time and assure you fine finishes and fast removal of metal.

**POPE MACHINERY CORPORATION**

No. 51



**POPE MACHINERY CORPORATION**  
261 River Street, Haverhill, Massachusetts

Gentlemen:

Please mail me, without obligation or personal follow-up, a copy of your new CATALOG NO. 58.

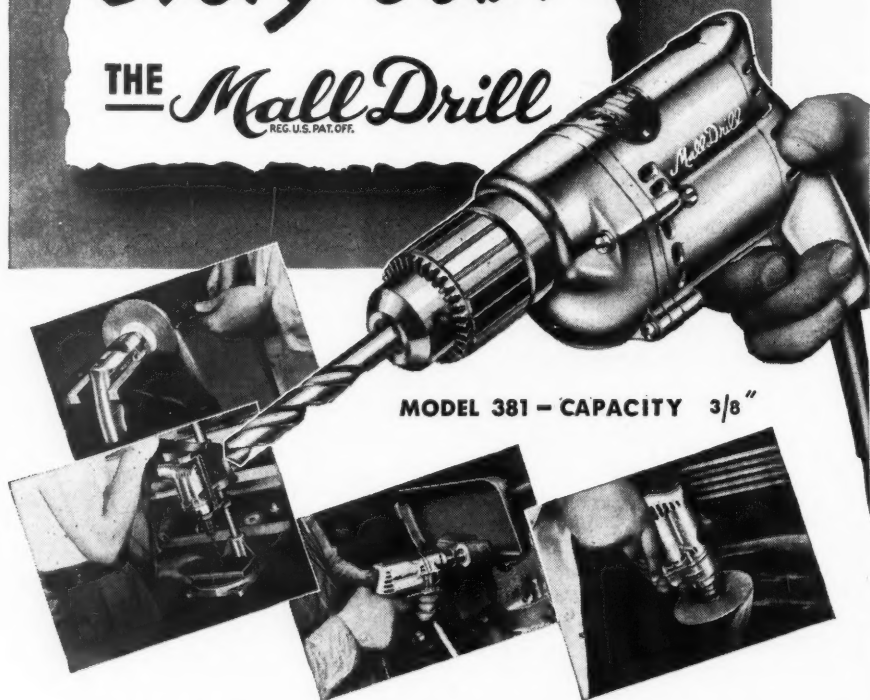
Name \_\_\_\_\_ Position \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

**THE DRILL ...**  
*for*  
**Every Job!**

**THE** *Mall Drill*  
REG. U.S. PAT. OFF.



MODEL 381 - CAPACITY  $\frac{3}{8}$ "

Here is a handy portable electric tool that not only provides a drill for all materials—wood, brick, masonry, steel and plastics—but can also be readily adapted for grinding, sanding, wire brushing, buffing and polishing. When held in a vise and equipped with a grinding wheel, it is excellent for sharpening tools; when fitted into a special stand, it converts into a drill press. Other models available with  $\frac{1}{4}$ " to  $\frac{7}{8}$ " capacities.

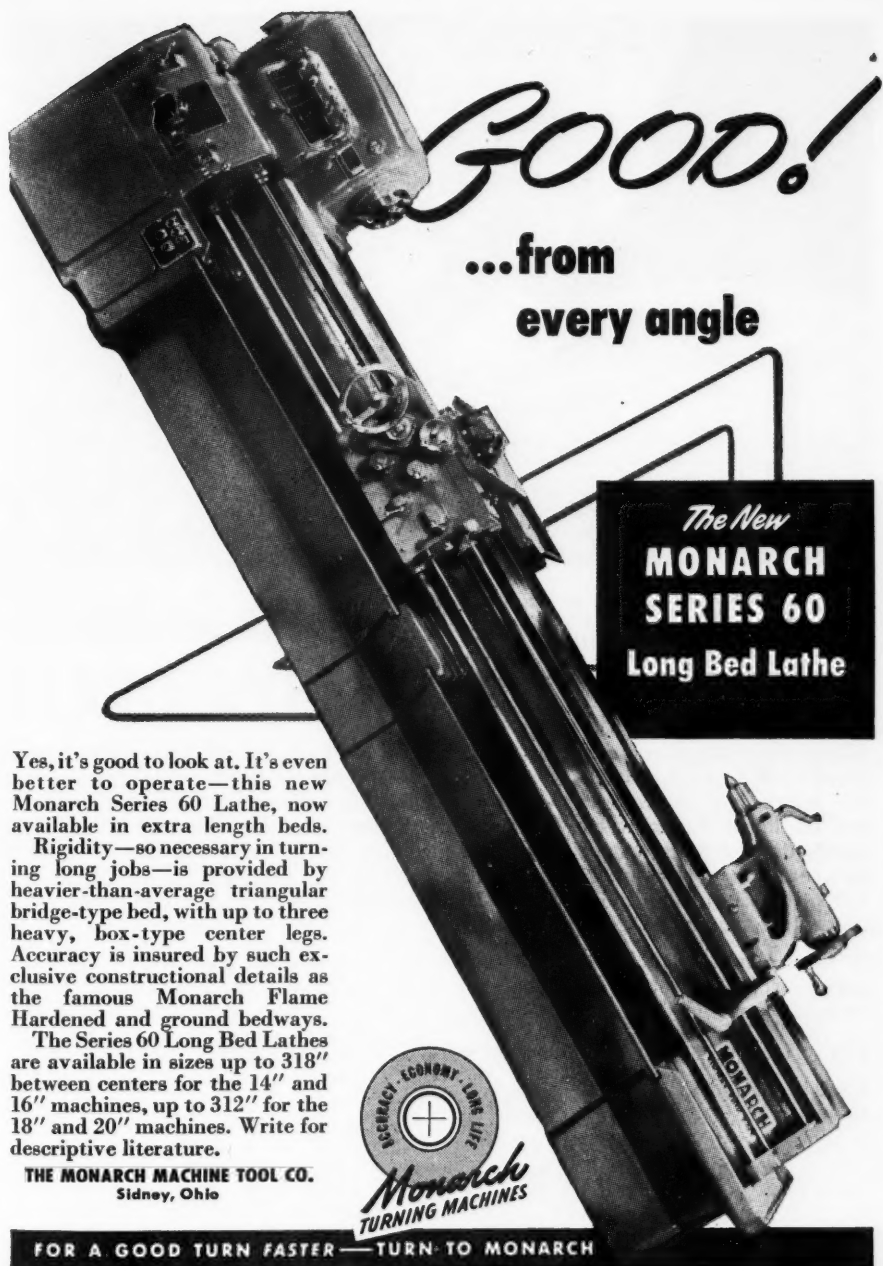
Ask your Supplier or write Power Tool Division for literature.

**MALL TOOL COMPANY**

7814 South Chicago Avenue

Chicago 19, Illinois

Over 26 Years of "Better Tools For Better Work"



# GOOD!

...from  
every angle

*The New*  
**MONARCH  
SERIES 60**  
Long Bed Lathe

Yes, it's good to look at. It's even better to operate—this new Monarch Series 60 Lathe, now available in extra length beds.

Rigidity—so necessary in turning long jobs—is provided by heavier-than-average triangular bridge-type bed, with up to three heavy, box-type center legs. Accuracy is insured by such exclusive constructional details as the famous Monarch Flame Hardened and ground bedways.

The Series 60 Long Bed Lathes are available in sizes up to 318" between centers for the 14" and 16" machines, up to 312" for the 18" and 20" machines. Write for descriptive literature.

**THE MONARCH MACHINE TOOL CO.**  
Sidney, Ohio



**FOR A GOOD TURN FASTER — TURN TO MONARCH**



**[** *Certifying the spacing of location pins on a fixture, with two combinations of Jo-Blocks.* **]**

## **When the Jo-Blocks say "it's right"—then it's RIGHT!**

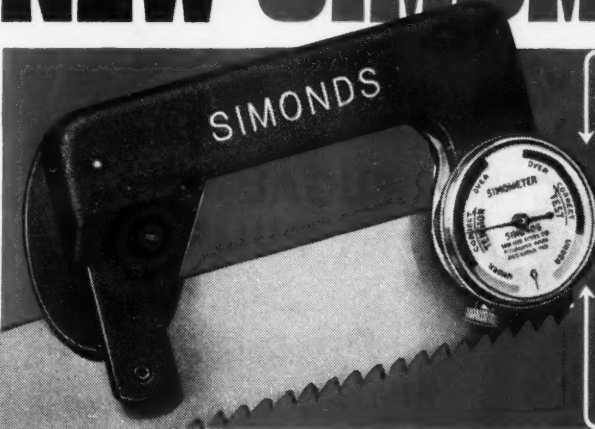
When you take a measurement with Jo-Blocks and the Jo-Blocks show the dimension is per specification . . . *that's that!* Genuine Johansson Gage Blocks are warranted accurate to within  $\pm .000002"$ ,  $.000004"$  or  $.000008"$ . They are made in America by Ford Motor Company only. They are used by hundreds of manufacturers, as master gages to check working gages, micrometers, etc., as precision layout tools and frequently as actual working gages (since the cost of an individual Jo-Block or two is often appreciably less than that of a specially built working gage).

If your plant—particularly your tool-room—is operating without the reassuring control of a set of genuine Ford Jo-Blocks and Accessories, it would be well to consider this very moderate investment. Write for latest literature.

**FORD MOTOR COMPANY • JOHANSSON DIVISION**  
**3607 SCHAEFER RD. DEARBORN, MICH.**


  
**Johansson**  
**GAGE BLOCKS**

# NEW SIMOMETER



gives you accurate

## TESTED TENSION

in less than  
1 minute per blade

Here's how  
**SIMONDS Quick and Easy Tensioning Method gives you  
LONGER BLADE LIFE!**



**Avoid Undertension** which causes crooked cutting, spoiled work, lost time.

**Avoid Overtension** which causes blade-vibration, rapid dulling of teeth, frequent blade-breakage.

**Slip the Simometer Directly over Blade**, tighten two thumb-screws . . . now put tension on blade until **Simometer** needle moves into green zone . . . and you can see at a glance you have the right tension on the blade. Ask your distributor.

### SIMONDS ALSO MAKES:



FLAT GROUND STEEL STOCK



"RED END" FILES



METAL-CUTTING BAND SAWS



CIRCULAR METAL-CUTTING SAWS

**SIMONDS**  
SAW AND STEEL CO.

FITCHBURG, MASS.

Other Divisions of SIMONDS SAW AND STEEL CO.  
making Quality Products for Industry

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*Special Division  
Percussion Steels*

**SIMONDS**  
CHICAGO, ILL.

*Grinding  
Wheels and Grinders*

**SIMONDS**  
MONTREAL, QUE.

*Simonds Products  
for Canada*

## SIMONDS "Red End" HACKSAW BLADES



**BRANCH OFFICES:** 1350 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 416 W. Eighth St., Los Angeles 14, Calif.; 228 First St., San Francisco 3, Calif.; 311 S. W. First Avenue, Portland 4, Ore.; 31 W. Trent Ave., Spokane 8, Washington. *Canadian Factory:* 595 St. Remi St., Montreal 30, Que.

# TURN THE CLOCK AHEAD IN YOUR COOLING METHOD



## CENTRIFUGAL COOLANT PUMPS



**P**rotect tools and products . . . prolong equipment life . . . save time . . . save money . . . all worthy of your closest attention.

In cooling tools...FULFLO PUMPS go all the way . . . for they give longer life to tools, cut costs and permit better finishes.

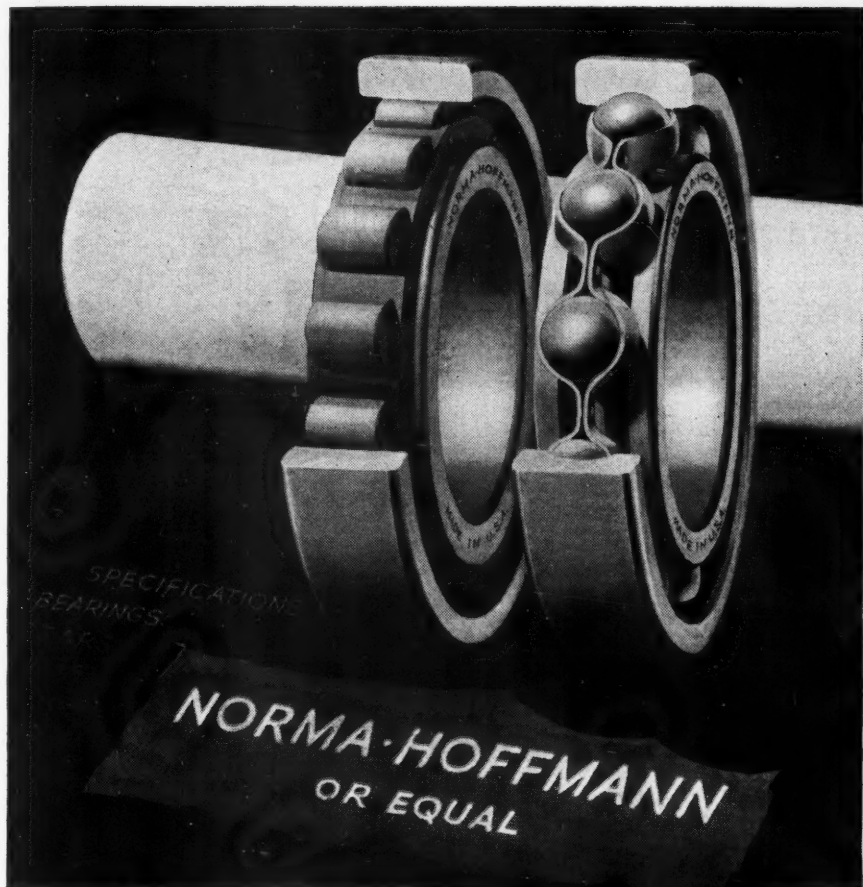
Pipe sizes:  $\frac{3}{8}$ " to  $1\frac{1}{2}$ ". Motor, direct or belt drives.

*Write on your letterhead for  
Fulflo Mechanical Data Book.*



**Specialties Co., Inc.**  
BLANCHESTER, OHIO



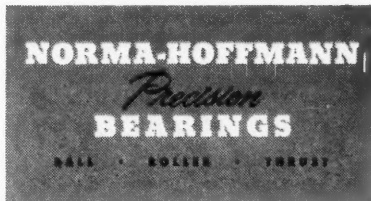


## A Good Beginning For Any Product

Here's why "Norma-Hoffmann or equal" is found on thousands of blueprints embracing all types of equipment. It results from designers' preference for bearings that have earned a reputation over the past 30 years for *precision* and *quality*.

And with good reason! These bearings provide ruggedness, dependability, long life and low upkeep. They assure minimum cost per bearing-year of service. Their accuracy and built-in high anti-friction characteristics improve product perform-

ance. While the wide range of choice . . . 108 distinct series, over 3,000 sizes . . . makes selection easy.



NORMA-HOFFMANN BEARINGS CORPORATION, STAMFORD, CONNECTICUT • FIELD OFFICES: New York, Chicago, Cleveland, Detroit, Pittsburgh, Cincinnati, Los Angeles, San Francisco, Dallas, Seattle, Phoenix

**More power to you  
More speed to you  
More profit to you**

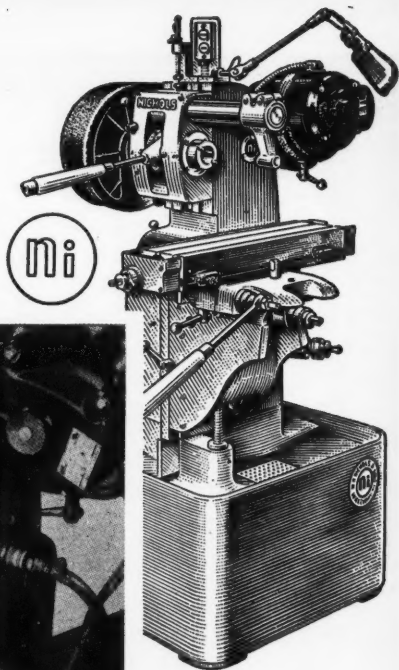
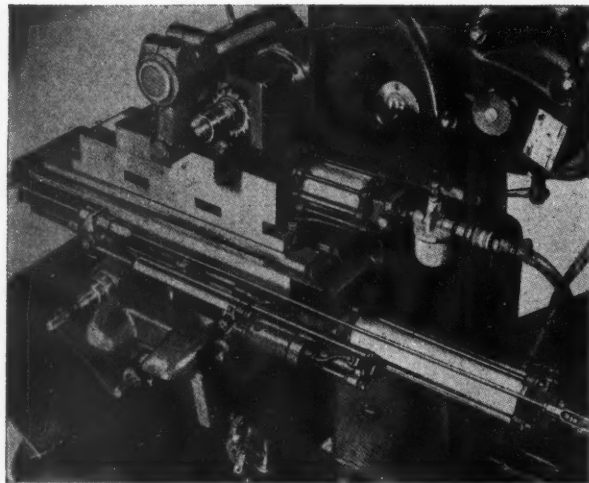


Photo shows Nichols power feed attachment installed. In this case, work is held in an air-operated vise



## ...with the *New Nichols* Power Feed Attachment

Here is a tested and proved power feed attachment that is an added production asset for any Nichols Miller. It is designed to reduce the time of the operating cycle and reduce the operator's duties so that often one operator can run two or more machines.

This power feed attachment is designed for fast table advance — maximum proper cutting feed — fast table return — automatic shut-off. It is completely automatic except for loading and unloading the work. Rapid traverse and work speeds are easily and quickly changed to suit

all classes of jobs within the capacity of the machine.

Basically this attachment is a Bellows air feed unit used in conjunction with a Hydro-Check. Thus a positive, infinitely variable feed is obtained throughout the 9" maximum cutting stroke by using regular shop air lines with 75 to 175 lbs. pressure.

The Nichols power feed attachment can be installed either before or after shipment of the Nichols Miller. It can be installed quickly on any Nichols Miller ever built. Write for details.

**THE** *Nichols* **MILLER**

MANUFACTURED BY W. H. NICHOLS & SONS, WALTHAM, MASSACHUSETTS  
NATIONAL DISTRIBUTORS. NICHOLS-MORRIS CORP., 44A CHURCH ST., NEW YORK 7, N. Y.

Send for free Nichols Miller Catalog





## BEATS SPIRALS 2 TO 1

**T**HIS manufacturer of steel kitchen cabinets was using hand spiral screw drivers to fasten hinges on doors because they never found a power screw driver light enough to hold in one hand while other hand holds the door. Screws are self-tapping type, size 8-32. The Rotor Application Engineer had the answer: Use the 26-ounce Rotor Air

Screw Driver. They did, with these results:

*Output doubled.* Twice as many hinges are screwed on per day with this "fly-weight" 1000 R.P.M. Air Powered Screw Driver. Cuts costs 50%.

We'd be glad to tackle similar problems in your plant.

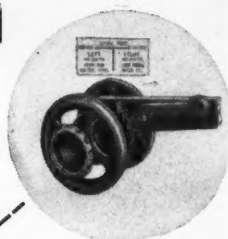
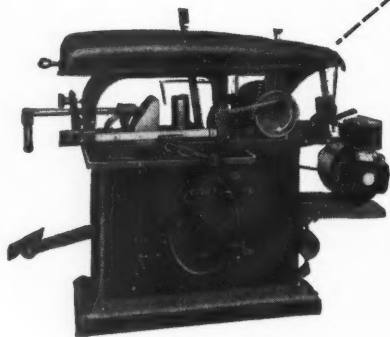
**AIR O'TOOL**



THE **ROTOR TOOL** CO.  
CLEVELAND, OHIO



# New Patented Feed Control Provides 0 to 70 Pounds Pressure to Saw Blade



New No. 3 Hy-Duty Keller Power Hack Saw has a patented feed control. An easy turn of a hand wheel quickly applies the proper pressure to cut everything from thin wall tubing to the heaviest bar stock at maximum cutting speed . . . without injury to saw blades.

## OTHER FEATURES

Standard equipment includes automatic lift on reverse stroke . . . quick acting swivel vise . . . automatic safety stop switch . . . chip free vane type coolant pump . . . new adjustable foot lift and numerous other features.

## KELLER POWER HACK SAWS MADE IN 8 MODELS

From the 8 models of KELLER Power Hack Saws, ranging in price from \$80.00 up, you can easily select the unit for your job.

Ask your dealer about these outstanding  
Keller Power Hack Saws or write Dept. M-68.

*Sales Service Machine Tool Co.*  
2363 UNIVERSITY AVE. ST. PAUL 4, MINNESOTA

Acc Sod  
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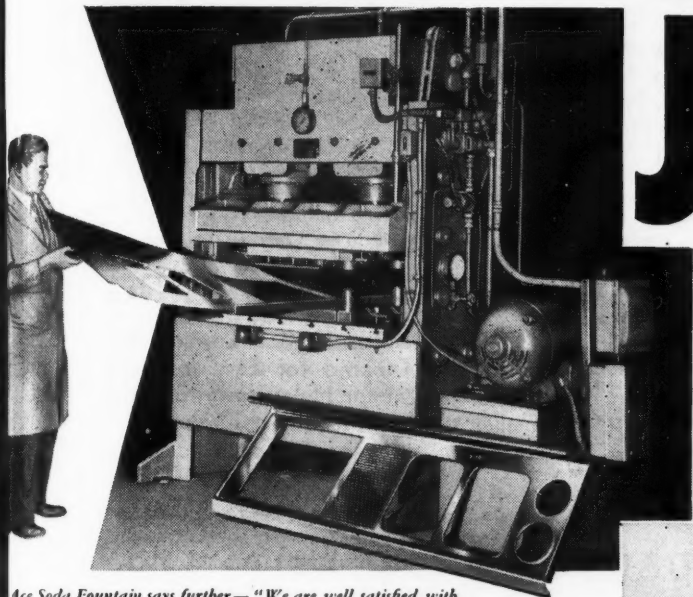
NAM

K

215

**YOU have answered  
the long-felt need for  
a SMALL PRESS that does a**

**BIG  
JOB"**



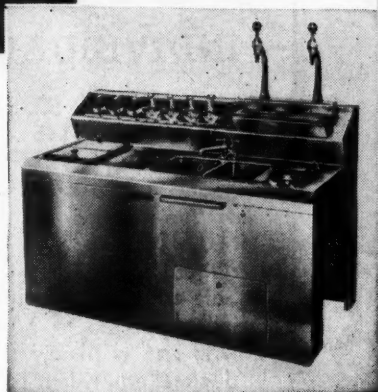
**ACE SODA FOUNTAIN  
USES A KRW 100-TON  
PRESS TO BLANK AND  
FORM STAINLESS STEEL  
TOPS . . . RELEASING  
LARGER EQUIPMENT  
FOR OTHER WORK.**

*Ace Soda Fountain says further — "We are well satisfied with the performance of your model 37V Hydraulic Press. Its versatility, in the various blanking and forming operations which we do, exceeds the claims made in your specifications."*

**INDUSTRY HAS PROVEN** that, on a large percentage of average blanking and forming work, large, heavy-tonnage presses, with their high initial and operating costs are unnecessary. The experience of many KRW users has demonstrated this fact beyond any doubt.

KRW Hydraulic Presses are highly adaptable . . . they are available in tonnages from 25 to 100 . . . in varying bed widths and lengths. Because they are hydraulically operated and not mechanically driven, they are extremely quiet and vibrationless in operation. First cost is very low, operating costs are still lower. In one instance, the purchase price of a KRW Press was less than the foundation cost of heavier equipment originally planned.

Let us know your needs, we'll show you how to save money in a big way. Deliveries in 8-10 weeks on large presses, one week on standard presses.



*Many parts of this Ace Soda Fountain, including the top, are blanked and formed on the KRW Press shown.*

**NAME YOUR NEEDS! MAIL COUPON TODAY!**

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

Please send complete information on New KRW 100-ton Hydraulic Presses.

Name .....

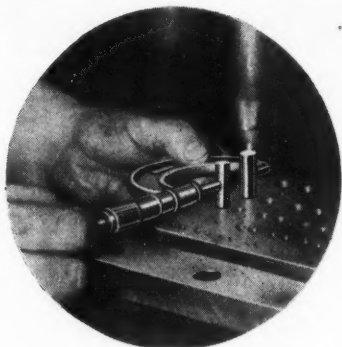
Address .....

**K·R·WILSON**

215 MAIN ST. · BUFFALO 3, N. Y.

## YOUR FIRST and WISEST CHOICE

Eliminate fumbling and guessing  
when gaging Holes, Slots, Finding  
Centers, Locations, Etc.  
Horberg Drill Size Pin Gages are  
accurate to  $\pm .0001$  —  $.0000$ .



FOR



DEPENDABLE GAGING

• Overall Length  $1\frac{1}{2}$ " • Lower Half  
Concentric Tapered for Easy Insertion  
and Alignment for Holes down to  $.0012$   
smaller • Oil Hardened Tool Steel.  
No other pin gage has such accuracy  
at so low a cost.

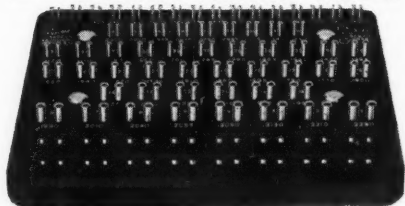
INDIVIDUAL STOCK SIZES \$1.00 each

LETTER SETS: 52 gages  
from A to Z—\$45

FRACTION SETS: 60  
gages  $\frac{3}{64}$ " to  $\frac{1}{2}$ " in steps  
of  $\frac{1}{64}$ "—\$50

NUMBER SETS: 120  
gages 1 to 60—\$90

Sets come in pairs for gaging any number of similar holes. All sets  
include stands of 3 plates and cover, so that gages stand upright.  
Drill size is plainly stamped in front of each hole, together with  
decimal equivalent to the ten-thousandth of an inch.



Prices F.O.B. Bridgeport, Conn. Immediate Delivery.

THE *Horberg* GAGE COMPANY

19 STAPLES STREET, BRIDGEPORT 1, CONN.



WHEN YOU WANT *More* TOOL LIFE

TRY **BARBER-COLMAN** CARBIDE TIPPED MILLING CUTTERS

This job was slow and costly because of low tool life and high cutter breakage. Three intermittent bosses on cast-iron brackets required the removal of  $1\frac{1}{4}$ " stock. Hard spots and abrasive action of the material combined to shorten tool life by nicking and chipping the cutting edges.

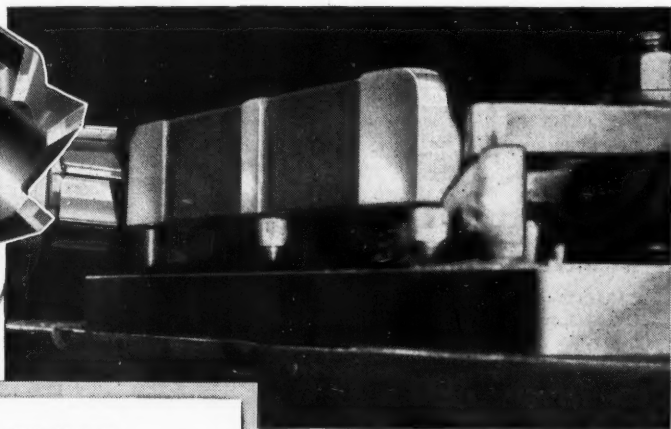
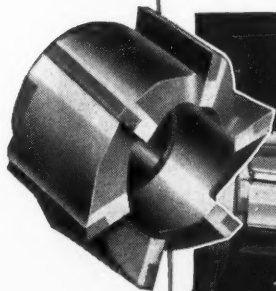
After careful analysis of all factors, Barber-Colman Cutter Engineers recommended the use of carbide tipped shell end mills, with fewer teeth and slight-spiral gashes. Today, experience-tested B-C tip mountings and heat-treated high speed steel bodies are suc-

cessfully withstanding the shock of the hard spots, and tool life and production are increased approximately 400%.

If your job conditions are suited to the use of carbides, consult a Barber-Colman representative on your next production problem. Experience the satisfaction that this manufacturer had in improving operation and increasing production.

**Barber-Colman Company**

GENERAL OFFICES AND PLANT 176 LOOMIS ST., ROCKFORD, ILLINOIS, U.S.A.



**JOB FACTS**

Operation — Face mill 3 bosses removing  $1\frac{1}{4}$ " stock, center boss  $2" \times 1"$ , end bosses  $2" \times 2\frac{1}{2}"$ .

Material — Medium cast-iron.

Cutters — B-C Carbide Tipped Shell End Mills,  $2\frac{1}{4}" \times 1\frac{1}{2}" \times 1\frac{1}{8}"$ , slight spiral gashes.

	HSS Cutter	C-T Cutter
Feed .....	3"-4" per min.	15" per min.
Speed .....	40 S.F.M.	240 S.F.M.
Floor-to-floor .....	30-40 in 10 hrs.	90 in 10 hrs.
Tool Life .....	50 pcs. per sharpening.	200 pcs. per sharpening.



MODERN MACHINES

DEMAND *Modern* CUTTING TOOLS

**NEW, TYPE-DX**

# HEAVY DUTY Shoplifter

**Two Capacities**

**2000 lbs. and 1000 lbs.**

A larger, huskier version of the popular Type D 500 lb. Shoplifter, but retaining the easy handling features of the smaller lifter. Platform and base frame have an overall width of 24" that allows easy passage in narrow aisles, between presses, and through doorways. Hoisting unit is ball bearing equipped. Automatic friction-disc brake holds load at any point, not necessary to set or release pawl or brake device. Only 20 lbs. pressure is required on crank handle to raise or lower load. Extra heavy construction gives rigid stability that enables the operator to handle maximum loads with ease and smoothness. No other lifter of equal capacity on the market can match the Shoplifter for value. One user said: "It's a lot of machine for the money."

## SPECIFICATIONS

**CAPACITY**—1000 lbs. and 2000 lbs.

**OVERALL HEIGHT** (to clear)—6'8".

**PLATFORM LIFT**—54".

**PLATFORM PLATE**—24" wide x 27 1/2" long (30" out from uprights).

**BASEFRAME**—24" wide x 50 1/2" long overall. Open end front.

**BASE WHEELS**—5" fixed wheels, 6" swivel casters with push bar steer.

**HOIST UNIT** (two capacities)—Ball bearing equipped, crank up and down action, automatic safety brake holds load at whatever point raised. Drum scored for cable.

**PAINTED**—Standard olive green finish.

**PRICE**—1000 lb. capacity.....\$320.00

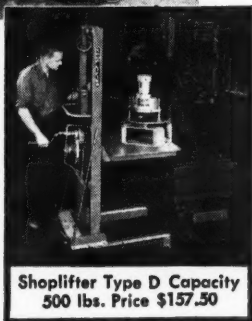
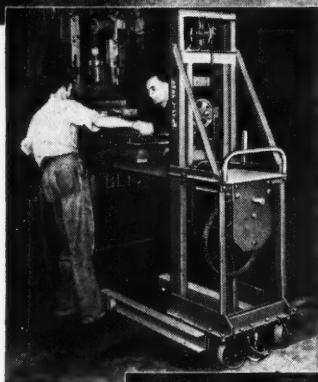
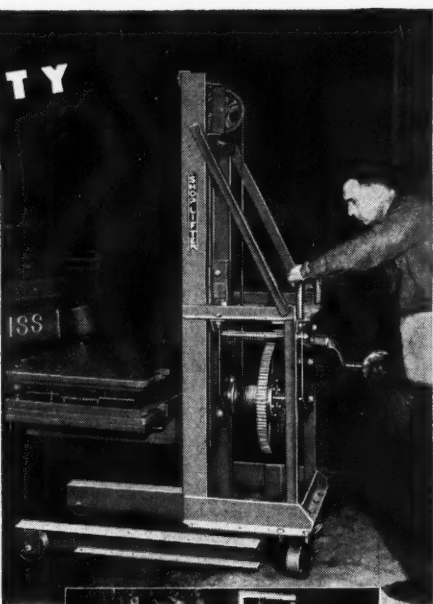
2000 lb. capacity.....\$370.00

f.o.b. Chicago, freight prepaid to any destination in U.S.

Heavy duty foot operated floor lock.....\$15.00 Extra

**ECONOMY ENGINEERING CO.**

2637 West Van Buren Street, Chicago 12, Illinois



Shoplifter Type D Capacity  
500 lbs. Price \$157.50

# THE ROCKET MULTIPRESS\*

## IS 3 TIMES

## FASTER

1100 ipm Approach Speed

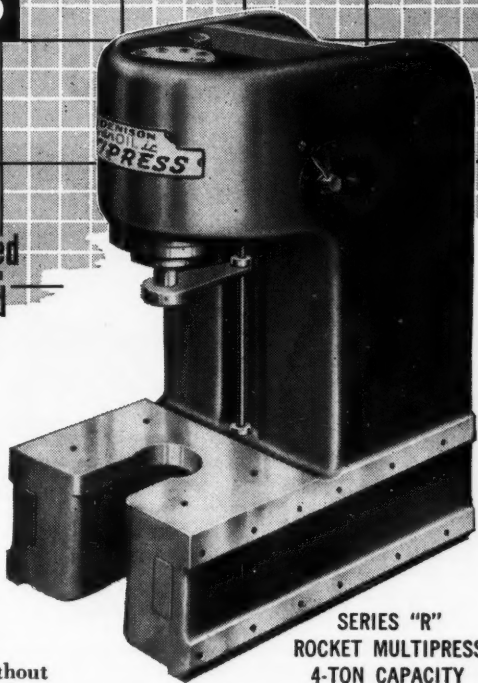
450 ipm Pressing Speed

750 ipm Return Speed

Now you can have all the oil smooth efficiency of the Denison HydroILic Multipress with the plus feature of speeds comparable to the fastest. Yes, 1948 models of the Multipress are faster than ever . . . yet retain all the advantages of the 4-ton series.

Three design changes . . . one in the control system, one in the operating component and one in the power system have combined to provide increased production without sacrifice of either tonnage or operating characteristics of standard models.

If you need greater production at lower cost, require smaller more compact press equipment, want to reduce the wear of expensive dies and tooling, or make use of unskilled labor without sacrificing quality of your product—write today for complete information on the Denison Rocket Multipress. Ask for specific data on the use of the Multipress in the operation in which you are most interested. No obligation of course.



SERIES "R"  
ROCKET MULTIPRESS  
4-TON CAPACITY

### AUTOMATIC CYCLING—COMPARISON CHART

Stroke in Inches	6	5	4	3	2	1	¾	½	¼
Standard Automatic Multipress	20	25	30	40	58	104	130	174	275
Rocket Multipress	75	85	100	120	160	275	300	390	450

Rates shown are for complete cycles per minute.

\*REG. U. S. PAT. OFF.



THE **DENISON** ENGINEERING CO.  
1153 Dublin Road Columbus 16, Ohio

**DENISON**  
EQUIPMENT *IN* APPLIED  
*HydroILic*

# HANNIFIN

## HYDRAULIC CYLINDERS



*a Plus Value*

...IN THE MACHINES YOU *Use!*  
...IN THE PRODUCTS YOU *Build!*

IT'S a better machine, when it's equipped with HANNIFIN TRUE BORED Cylinders. You get smooth, full-power performance; long, maintenance-free service. Look for the name "HANNIFIN"; it's a mark of QUALITY.

YOU know your product is *good* and your customers know it, too, when you build it with Hannifin Cylinders. Take advantage of Hannifin service. Cylinders engineered to your requirements. Prompt, dependable delivery.

(Above) Hannifin Hydraulic Cylinders contribute to the precision performance of MORRIS MACHINE TOOL COMPANY'S 12 spindle "MOR - SPEED" machine for performing reaming operations on cylinder blocks.

### ASK FOR A COPY OF HYDRAULIC CYLINDER BULLETIN

A big 52-page catalog listing standard Hannifin Cylinders, complete with specifications, dimensions, and engineering data. Ask for Bulletin 110-I.

**HANNIFIN**

*Nationwide  
Sales and  
Service*

## HANNIFIN CORPORATION

1101 So. Kilbourn Ave., Chicago 24, Ill.

AIR CYLINDERS • HYDRAULIC CYLINDERS • HYDRAULIC PRESSES  
PNEUMATIC PRESSES • HYDRAULIC RIVETERS • AIR CONTROL VALVES

• 7200 stainless steel stampings per hour—

• tolerances held within 0.002" —

... using

# DANLY

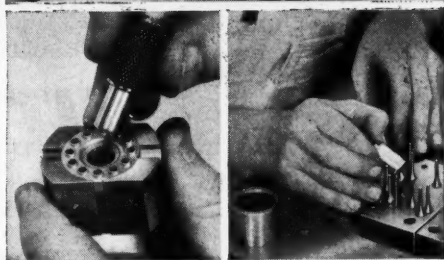
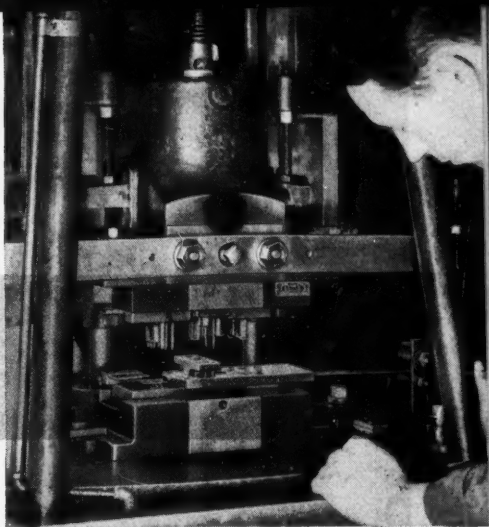
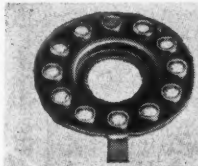
## STANDARD PRECISION DIE SET

Sustained operating precision of die set reduces die wear... produces 200,000 stampings per grind

Inherent accuracy in Danly Die Sets permits taking full advantage of the die maker's precision under actual press operating conditions. As a result, close tolerances may be held and tool life is substantially increased.

In the stamping operation shown, stainless steel parts for electrical instruments are pierced, formed and blanked in an intricate progressive die. Tolerances are extremely close, and finished parts must pass rigid gage inspection.

Stampings are produced at a rate of 120 per minute. At



this high speed, a tolerance of 0.002 in. is held on inside and outside diameters and the distance between the bent arms. Danly Die Set accuracy is a major factor in maintaining punch-and-die relation, resulting in production of 200,000 parts between grinds.

**DANLY ENGINEERING SERVICE**—Use Danly Die Sets to insure the same close precision, high production and long die life on all of your press work. Consult our Engineering Dept. for helpful recommendations on die sets—large or small, standard or special—for any type of press operation. (No obligation.)

### DANLY NATION-WIDE

★ ASSEMBLY SERVICE



Danly offices in 10 key cities give immediate attention to your orders. Assembly plants (marked with stars) stock interchangeable parts for quick delivery of any standard die set to your specifications.

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- ★ Cleveland 14, 1550 E. 33rd St.
- ★ Dayton 8, 990 E. Monument Ave.
- ★ Detroit 16, 1549 Temple Ave.
- ★ Grand Rapids, 113 Michigan Ave., N. W.
- ★ Long Island City 1, 47-98 37th St.
- ★ Los Angeles 54, Ducommun Metals & Supply Co., 4890 S. Alameda
- ★ Milwaukee 3, 111 E. Wisconsin Ave.
- ★ Philadelphia 44, 18 W. Chelton Ave.
- ★ Rochester 4, 16 Commercial St.



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## DANLY

**DANLY MACHINE SPECIALTIES, INC.**  
2100 SOUTH 52ND AVENUE CHICAGO 50, ILLINOIS

PRECISION DIE SETS...STANDARD AND SPECIAL

# HOW TO SIMPLIFY INTRICATE DESIGN with **HELI-COIL**® SCREW THREAD INSERTS



**H**ELI-COIL Screw Thread Inserts provide a stronger and more durable tapped thread for assemblies in iron, steel and light metal castings, forgings and machined parts—also in plastics, wood and other structural materials. The above drawings show how a stud assembly can be simplified by using a cap screw and a Heli-Coil Insert. This is only one of many ways in which Heli-Coil Inserts are serving to streamline threaded fastenings and adjacent parts.

Heli-Coil Inserts are precisely engineered helical coils of stainless steel or phosphor bronze wire. Installed in tapped threads of all standard profiles, they fit accurately and provide a hard, smooth,

tough lining between tapped thread and screw, strongly resisting wear, abrasion, welding and stripping.

Aircraft engine manufacturers, at the outset of World War II were the first to use Heli-Coil Inserts as original parts. Since the war ended, these inserts have been widely adopted for many peacetime products, including automobiles, appliances, industrial machinery and many others.

In salvage and maintenance, also, Heli-Coil Inserts provide a simple solution to the difficult problem of replacing stripped threads. Engineering representatives are available for advice in the application and use of Heli-Coil Inserts.



*Representatives in all principal cities*

## **HELI-COIL CORPORATION**

Formerly AIRCRAFT SCREW PRODUCTS COMPANY, Inc.

**47-23 G 35th STREET, LONG ISLAND CITY 1, N. Y.**

\*REG. U. S. PAT. OFF.



# *Announcing the* **CLARK** TOMORROW'S ACCURACY TODAY **CLARK**

## **SUPERFICIAL HARDNESS TESTER**

### **FOR "ROCKWELL" TESTING OF**

- NITRIDED OR CARBURIZED STEEL
- VERY THIN MATERIALS
- ROLLED SHEET METAL
- VERY SMALL AREAS

On the Clark Superficial Hardness Tester, the depth of indentation is limited to .005" or less. Thus the unit is ideal for "Rockwell" testing of nitrided or carburized steel, exceptionally thin materials, rolled sheet metal, very small areas, and similar jobs. The Clark Superficial Tester may also be used for "Rockwell" testing of standard materials, wherever the metal is of uniform hardness throughout, or where a measurement of surface hardness only is wanted. A free circular gives full specifications. Write for your copy today.

See the New Clark Superficial Tester  
at the  
**AMERICAN SOCIETY FOR  
TESTING METALS SHOW**  
Book Cadillac Hotel, Detroit  
June 21st—25th  
BOOTH NO. 20

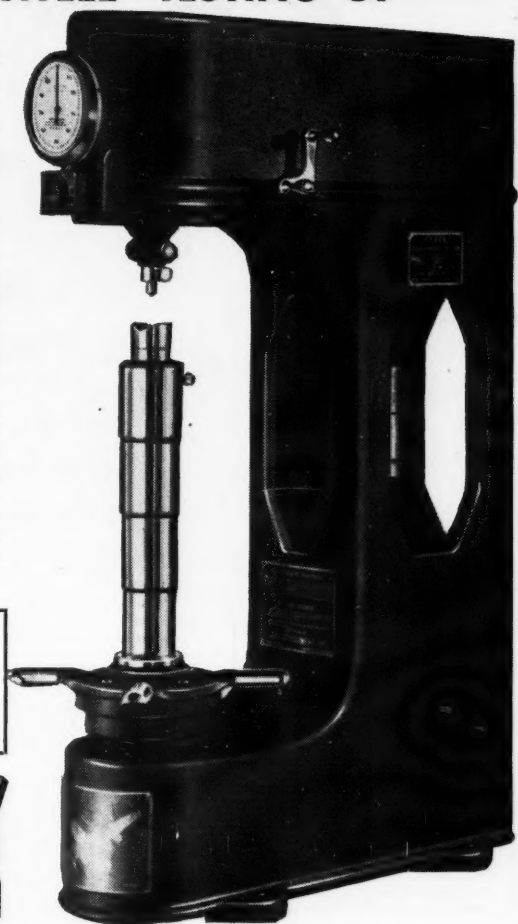
**CLARK**  
TOMORROW'S ACCURACY TODAY  
**CLARK**

**CLARK INSTRUMENT, INC.**

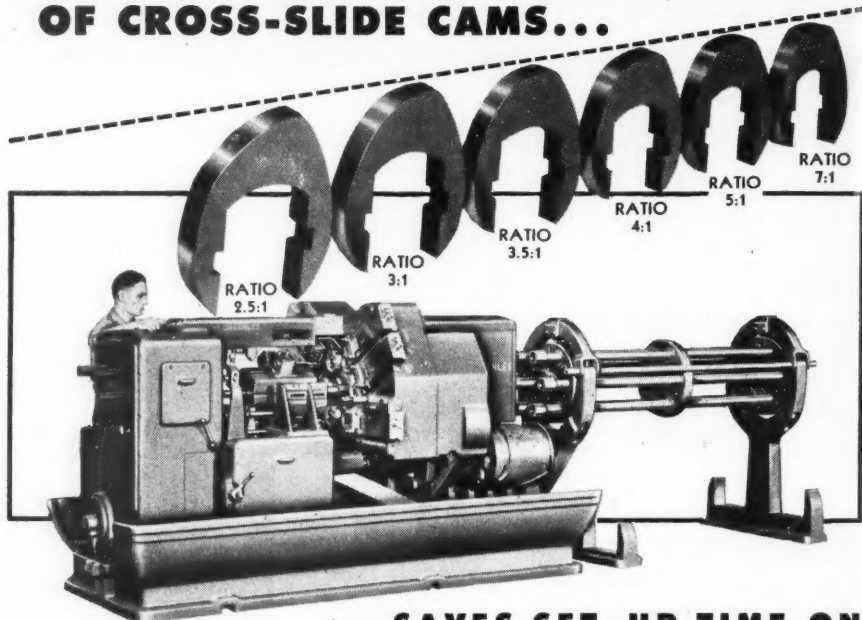
**10200 FORD ROAD**



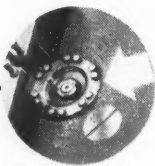
**DEARBORN, MICHIGAN**



## UNIFORM HIGH POINT OF CROSS-SLIDE CAMS...



## ... SAVES SET-UP TIME ON GREENLEE "6" AUTOMATIC SCREW MACHINE



### COMPENSATING STOPS SET AT FACTORY AND SELDOM NEED RESETTING

Compensating wheels (see above) carry adjustable hardened steel stop buttons and index in unison with the spindle carrier. Each button is locked to limit the travel of a given cross-slide to correspond with spindle position. All buttons are set at the factory and seldom require adjustment. This GREENLEE feature insures accuracy and uniform production at all spindle positions.

No matter what ratio cross-slide cam you select, the high point is always the same distance from the center of the cam shaft. This means that cams can be changed at will after cross-slide feed adjustments have been made *without having to re-adjust tools or bolders*. When trying out a set-up for best rates of cross feeds, this GREENLEE feature provides an obvious and substantial saving in time.

### CROSS-SLIDES INDEPENDENTLY OPERATED

On the GREENLEE "6", each cross-slide has its own individual feed cam, so the feed rate of each slide can be set independently of any other. This affords maximum set-up flexibility, and permits selection of the best feed rate for each cross-slide tool. Cams are

standardized and designed to provide a range of cross feed rates which are in simple fractional relation to the main tool slide feed rate. Cams are fully interchangeable — any cross-slide cam can be used on any cross-slide — thus effecting a substantial saving in cam expense.



#### Send for Literature

Write today for Booklet and Circular giving full information on all GREENLEE features and describing the advantages of the new Lead-Screw Feed for heavy-duty precision threading. Learn why the Greenlee "6" is often called "The Operator's Favorite".



GREENLEE BROS. & CO., 1886 MASON AVE., ROCKFORD, ILLINOIS

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

The *Air Valve* You Have Been Looking For  
**PILOT OPERATED • SOLENOID CONTROLLED**  
*A New ROSS Piston Poppet Type Valve*

✓ **FAST OPERATING**  
as high as 400 cycles per minute.

✓ **LARGE ORIFICE AREA**  
results in fast exhaust, minimum restriction to air flow.

✓ **POSITIVE SEAL**  
by line pressure.

✓ **SIMPLICITY OF DESIGN**  
removing end plugs permits replacement of piston poppet assembly — no need to disturb piping or to move valve from position—no "down time".

✓ **ECONOMICAL TO OPERATE**  
current consumption 1.2 amps. at 110 volts—60 cycle.

✓ **LONG SERVICE ASSURED**  
many Ross valves installed more than 20 years ago are still in active service.

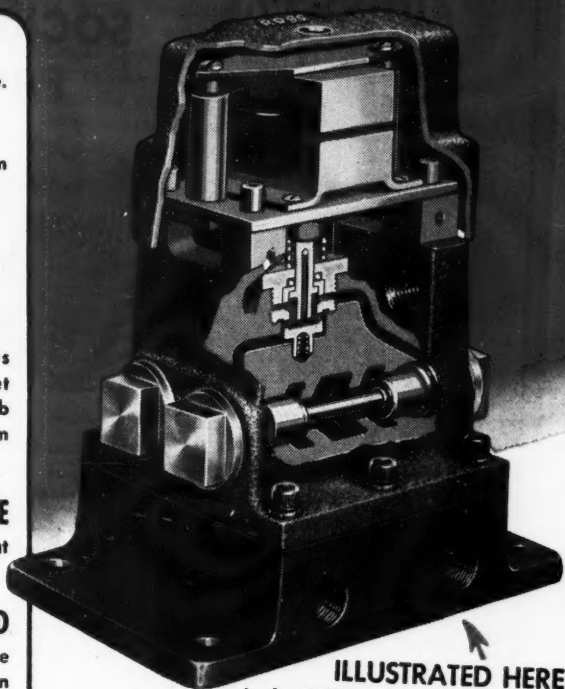
✓ **SMALL AND COMPACT**  
appreciated where space is limited.

✓ **ALL PARTS**  
non-corrosive metals.

✓ **ACCURATELY MACHINED**  
and all parts interchangeable.

A TYPE AND SIZE  
FOR EVERY PURPOSE  
★  
OVER 100 DIFFERENT MODELS

**ROSS**  
*Air Control*  
**VALVES**



ILLUSTRATED HERE  
is the **FOUR-WAY**— $\frac{3}{8}$ " Capacity

*Available in:—*

- **THREE-WAY**  
normally open, or normally closed
- **FOUR-WAY** and
- **FOUR-WAY, Five port.**  
may be had in  $\frac{1}{4}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ " and  $\frac{3}{4}$ " pipe size

ROSS OPERATING VALVE CO.  
120 E. GOLDENGATE AVE., DEPT. 157  
DETROIT 3, MICHIGAN

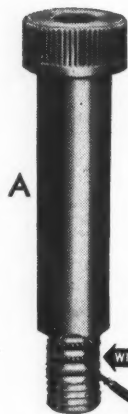
THE BRIDLE FOR AIR HORSEPOWER

# WON'T SHAKE LOOSE!

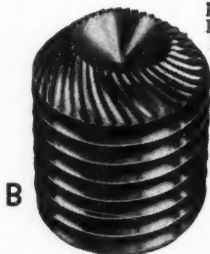


Reg. U. S. Pat. Off.

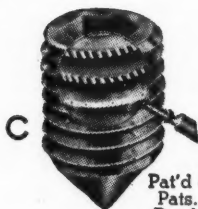
## SELF-LOCKING SOCKET SCREW PRODUCTS



Pat'd &  
Pats.  
Pend.



Pat'd &  
Pats.  
Pend.



Pat'd &  
Pats.  
Pend.

Knurling of Socket  
Screws originated with  
"Unbrako" in 1934.

They're  
**KNURLED!**

(A) The *Knurled* and swaged Threads of this "Unbrako" Socket Head Stripper Bolt make it a SELF-LOCKER that positively *won't shake loose*—tests prove it! This very feature solved a serious loss of production problem in connection with a High Speed Die, on which originally *plain* stripper bolts kept shaking loose. If similarly afflicted, be sure to substitute "Unbrako" Self-Lockers.

(B) The *Knurled* Cup Point of the "Unbrako" Socket Set Screw makes it a SELF-LOCKER—because the knurls dig-in and stay-dug.

(C) The *Knurling* of this "Unbrako" Socket Set Screw, as shown, swages the threads, so it becomes a most excellent SELF-LOCKER, for use where points other than cup-point must be used.

Get this—our patented "Unbrako" SELF-LOCKERS will prevent most any Set Screw application from working loose—so, write for detailed information contained in the "Unbrako" Catalog.

Ask for the name and address of your nearest "Unbrako" Industrial Distributor.

OVER 45 YEARS IN BUSINESS

# STANDARD PRESSED STEEL CO.

JENKINTOWN, PA., Box 556 • Branches: Boston, Chicago, Detroit, Indianapolis, St. Louis, San Francisco

# THIS NEW MADISON ROUGH BORING TOOL SLASHES HOLE COSTS!

This new Madison Rough Boring Tool is the fastest changing, fastest cutting boring tool made. Team it up with the Madison Reaming Cutter and you'll get more accurate finely finished holes at lowest cost. Like the Madison Reamer, the Roughing Cutter can be easily set to decimal sizes within its range. Because cutters may be prezised, disturbance of the setup is unnecessary when inserting a new or sharpened cutter in the bar. Cutter change is a matter of seconds. Simply back off the lock screw in the bar and the cutter slips out for resizing or replacement.

The Madison locating feature automatically centers the cutter in the bar, equalizing the load on cutting elements.

The cutter block is formed by the Madison cutting blades themselves. This exclusive Madison feature creates a more rugged cutter with no delicate mechanisms or separate parts. Madison Roughers have been used to bore holes as large as 17.590 and are made in the smaller range to 1" size.

These exclusive Madison features of simplified design are the reasons why the new Madison Rough Boring Tool performs with amazing speed. On field tests, stock removal requiring three passes with a conventional single point tool was executed in one pass with this new Madison Rougher.



Write for the Madison catalog today. Get the facts on Madison Boreamers, the tools that make one operation out of boring and super finish reaming.

**MADISON**  
MANUFACTURING COMPANY  
DEPT. MM-5 MUSKEGON, MICHIGAN



Besides combining accuracy with fast stock removal, note on the production sample below, the finish produced by the Madison Rough Boring Tool as compared to the rough finish produced by a single point tool.

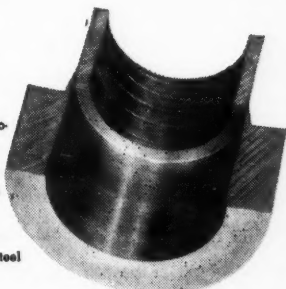
**Material**  
Cast Steel.

**Depth of cut**  
.597".

**Feed**  
.0075" per revolution.

**Surface speed**  
carbide tipped  
352 FPM.

**Surface speed**  
high speed steel  
155 FPM.



## CONTINUOUS UNIFORM PRODUCTION with HEVI DUTY BATCH TYPE FURNACES



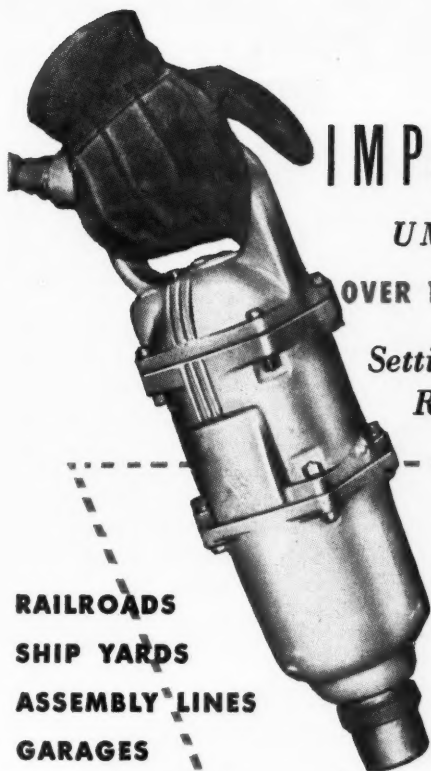
PHOTOGRAPH COURTESY HAINING, MAYHELL & MOORE, INC.

WITH the furnaces and quenching equipment shown, continuous production of uniformly heat treated parts is assured with a minimum of labor costs and floor space. After the carburizing cycle the load is removed from the Hevi Duty Carburizing Furnace — direct quenched in oil — washed and rinsed — and transferred into the Hevi Duty Pit Type Tempering Furnace. After tempering and cooling it is ready for finishing operations. At all stages of the heat treating cycle the parts remain in the work baskets, which are handled by an overhead hoist. • The construction and operating advantages of these Hevi Duty Batch Type Furnaces are detailed in bulletins HD-646 and HD-1245 — send for your copies today.

### HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES **HEVI DUTY** ELECTRIC EXCLUSIVELY  
MILWAUKEE 1, WISCONSIN





**RAILROADS**  
**SHIP YARDS**  
**ASSEMBLY LINES**  
**GARAGES**  
**TRUCK FLEETS**

*Thor*

## IMPACT WRENCHES

**UMATCHED for POWER**

**OVER 1000 HARD BLOWS A MINUTE**

*Setting SPEED and LOW COST  
 Records on Scores of Jobs*

**---METAL FABRICATING**

The Thor Wrench hits **HARD** once on every revolution of its rotor—and with more than 1,000 of these hard impacts a minute is outperforming everything in its class...for *speed* in driving nuts, bolts or cap screws—for *stamina* in standing up longer under impact shock—for *proving the best money saver* on every job! Call a Thor branch today, for a convincing demonstration.

**INDEPENDENT PNEUMATIC TOOL COMPANY**  
 AURORA, ILLINOIS  
 BRANCHES IN PRINCIPAL CITIES

*Thor*

**PORTABLE POWER**

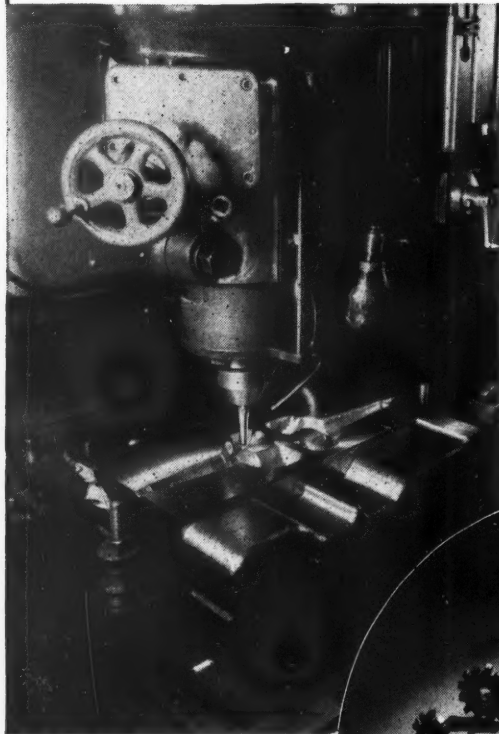
**TOOLS**

**PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY  
 ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS**

# Raise the Feed!

## CUT COSTS WITH

# T-J CUTTERS



A T-J Cutter at work on a drop hammer die block for steering knuckles. The material is molybdenum die steel of C45-C50 Rockwell.

Do your cutting in tough die steels *faster... with less breakage... and more work between grinds!* Use T-J Die Sinking Milling Cutters! They're designed for accuracy and sturdiness... made from a standard, extremely high grade steel... properly machined... scientifically heat-treated and accurately ground. Many styles and sizes... proved on countless tough jobs! Send for new catalog. The Tomkins-Johnson Co., Jackson, Mich.



FOR TOUGH JOBS SPECIFY



### TOMKINS-JOHNSON

DIE SINKING MILLING CUTTERS

# RACINE HYDRAULICS

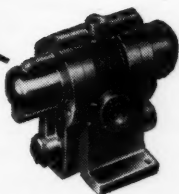
Provide Dual Pressure — Solenoid Controlled



**RACINE 4-WAY VALVE**  
Dual Solenoid pilot operated control valve — 2 or 3 positions. Available in sizes  $\frac{3}{8}$ " to  $1\frac{1}{2}$ " I.P.S., for electrical, hydraulic, mechanical or manual control.



**RACINE VARIABLE VOLUME PUMPS** Pressure up to 1000 lbs. p.s.i. Featuring Variable Volume with automatic constant pressure control. Capacities to 30 g.p.m.



**RACINE HYDRAULIC PRESSURE BOOSTER** Converts low pressure input into high pressure output. Various ratios to 7 to 1. Saves horsepower in two pressure systems.

PHOTOS COURTESY  
C. A. LAWTON COMPANY  
DE PERE, WIS.

This modern Lawton twin cushioned two die press operates through two RACINE Variable Volume Pumps and a RACINE Pressure Booster, controlled by a RACINE solenoid operated 4-way valve. High volume for the approach stroke, high pressure for the final closing action of the press, smoothly and positively applied, insure a clean steady drawing action. Your problems in the application of hydraulic force are given prompt and efficient consideration at Racine. Competent engineers are available in factory and field to develop hydraulic circuits that add to the design advantage of your product and the productiveness of your shop equipment. Get full data today. Write for catalog P-10-C. RACINE TOOL AND MACHINE COMPANY, 1770 State Street, Racine, Wis.



## RACINE

STANDARD FOR QUALITY AND PRECISION

## Feeling the Step-up

## In Light Metals Finishing?

*Monel*

*Dural*

*Aluminum*

*Stainless Steel*

Increasing demands and new-procedure requirements in finishing light metals are being met every day by cost-cutting, profit-building, product-improving Brightboy.

Results are obtained through Brightboy's one-operation precision action, which burrs, finishes and polishes to close tolerances, and at the same time achieves unusual surface effects where required.

Not until you see these results can you visualize the versatility and the savings which Brightboy's rubber and abrasive combination produces. Ask your distributor for the Brightboy catalog-manual and prices; write the Brightboy service department on specific production problems.

WHEELS • BLOCKS • STICKS • RODS



BURRING • FINISHING • POLISHING  
**1**  
IN ONE  
OPERATION

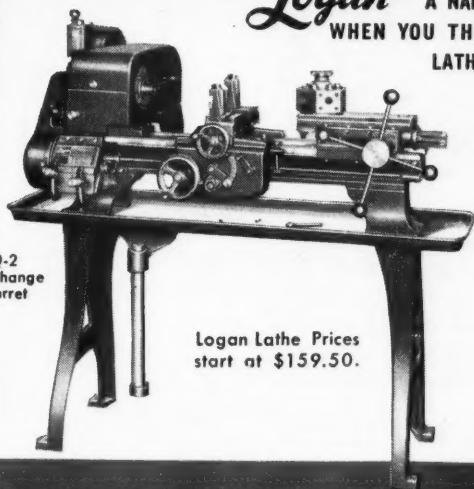
BRIGHTBOY INDUSTRIAL DIVISION  
WELDON ROBERTS RUBBER CO.

Newark 7, N. J.

The *SOFT RUBBER* binder **1** *CUSHIONS* the abrasive

# Logan

A NAME TO REMEMBER  
WHEN YOU THINK OF BETTER  
LATHES AND SHAPERS

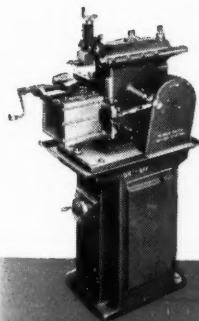


No. 840-2  
Quick Change  
Gear Turret  
Lathe

Logan Lathe Prices  
start at \$159.50.

## FAST ACCURATE ECONOMICAL

LOGAN Lathes speed output,  
hold close tolerances  
and keep down costs



LOGAN SHAPER

The ability of Logan Lathes to turn out a wide variety of work at high speed, with sustained accuracy, and at low cost results from sound, advanced design and rugged, precise construction. The Logan spindle revolves in a precision pre-loaded ball bearing mounting, needs no bearing adjustment from 30 to 1450 rpm. Total spindle run-out 12 inches from the bearing is less than .0008". Headstock bearing faces are held to an accuracy of .0005". Bed ways are within .0005" of parallelism. Self lubricating bronze bearings protect vital wear points. These are reasons why large industrial shops depend on Logan Lathes to maintain accuracy and cut costs on all medium and small work. Whether you want tool room precision or low cost production, get full information on rugged, accurate, economical Logan Lathes and Shapers.

V-2

**SPECIFICATIONS COMMON TO ALL LOGAN 10-INCH LATHES**... swing over bed, 10 1/2"... bed length, 43 1/8"... size of hole through spindle, 2 1/2"... spindle nose diameter and threads per inch, 1 1/2"—8... 12 spindle speeds, 30 to 1450 rpm... motor, 1/2 hp, 1750 rpm... ball bearing spindle mounting... drum type reversing motor switch and cord... precision-ground ways, 2 V-ways and 2 flat ways.

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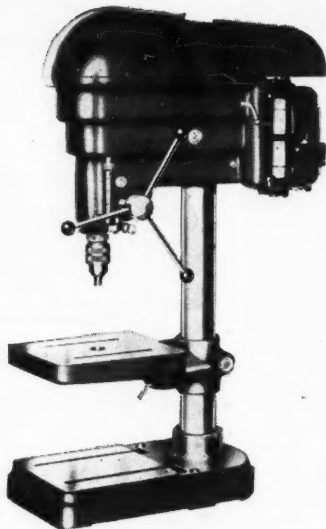
700 Commerce St.  
Dallas 2, Texas  
Central 4075

**LOGAN ENGINEERING CO. CHICAGO 30, ILLINOIS**

# BOICE-CRANE Series No. 2600 HELMET HEAD DRILL PRESSES

**DURABLE  
SENSITIVE  
ACCURATE**

**— Yet Low Priced! —**



84 different models for doing light and medium size work. Heads and other parts available for building up inexpensive special purpose machines.

Helmet-Heads have larger and longer quills for the spindle—to take heavier thrust loads and to do more accurate deep-hole drilling and tapping. Heavy box-type head has 33% to 50% more bearing for the quill, so 4" or more of the quill is always supported. Hence, years more wear at the point where most light drill presses fail, also less vibration and fewer broken tools.

A costlier 6-tooth spline drive—involute shaped spline teeth, and all long-wearing steel instead of die-cast. Heavier-walled column,  $\frac{3}{8}$ " thick for greater rigidity and

closer tolerance at the chuck on heaviest thrust. Balanced for higher spindle speeds.

Tapping Heads, and full line of wood-working accessories for routing, mortising, etc., are available as extras.

## SPECIFICATIONS:

Capacity: 15"; Maximum  $\frac{1}{8}$ " Drill,  $\frac{1}{2}$ " Tap.

Spindle Feed: 4".

Speeds: Hl-speed Models—500, 925, 1750, 3250, 5500.

Slo-speed Models—425, 775, 1330, 2200, 3340.

Bearings: 4 New Departure Ball. Grease-sealed.

Spindle:  $\frac{1}{2}$ " dia. 6-tooth involute type spline.

Tables: Standard—size 10" x 11"; tilts 45°.

Production—work surface 11" x 16".

Clearance Table to Chuck: Bench—17 $\frac{1}{2}$ "; floor—39 $\frac{1}{2}$ ".

Height overall: Bench—42"; floor—71".

## FOR A GUARANTEE OF SATISFACTORY SERVICE

specify only the products of manufacturers who **SPECIALIZE** in producing power tools, rather than making them a sideline.

**WRITE FOR FREE LITERATURE**

## BOICE - CRANE COMPANY

937 Central Avenue

Toledo 6, Ohio

DRILL PRESSES • JIG SAWS • BELT SANDERS •  
SAW JOINTERS • THICKNESS PLANERS •  
SPINDLE SANDERS • SPINDLE SHAPERS

• LATHES • JOINTERS  
• TILTING ARBOR SAWS  
• BAND SAWS



lightweight champ



The new Traytop line of light duty geared head engine lathes (10", 12½", 15", and 18" swing sizes) offers many "high price" lathe features at truly low cost: 12 spindle speeds, selected by color-coded dial, 48 thread and feed changes, exceptionally large spindles, anti-friction bearings, double-walled apron, totally enclosed gear box, many others. Distance between centers from 18" to 60". 15" and 18" sizes can be furnished with gap and gap block. Write for Bulletin T-100.



# cintilathe

## CINCINNATI LATHE & TOOL CO.

CINCINNATI 9, OHIO

# BAKER KEYSEATER

*for Speed and Accuracy!*

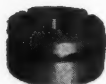
Baker Model 0 Keyseater meets demands for speed, accuracy and alignment in the finished keyseat. Soundly designed...sturdily built for trouble-free, long-life performance. Operated on the draw cut principle: equipped with a push-button controlled, non-reversing type, 2 HP, 1200 RPM motor, mounted on a pivoted base; crank action adjustable for setting stroke from 0 to 9". Capacity ample to cut keyways in mild steel up to 9" long by 1" wide at a feed of .005". Write for bulletin.



# BAKER JACKS

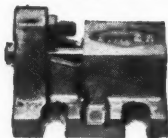
*for Easy Leveling!*

Baker Jacks solve the problem of keeping equipment level and in alignment—for maintaining highest efficiency of machine tools. These jacks are positive in action yet readily adjustable. Machines mounted on them can be checked frequently and corrected at little expense. Leveling time is negligible and the equipment is held firmly in place. Thoroughly tested... offered in three sizes. Write for more details.



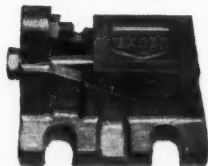
No. 41

*For lathes, milling machines, etc.*



No. 42

*For small planers, boring mills, etc.*



No. 43

*For large boring mills, planers, etc.*

**BAKER BROTHERS, Inc., Toledo, Ohio**

DRILLING, TAPPING, KEYSEATING and CONTOUR GRINDING MACHINES

# PROSSER CARBIDE GRINDERS

... Pay for themselves—fast ...

## in TOOLS SAVED!

Shop experience proves it: Prosser Grinders reduce waste and breakage of costly cemented carbide tools—and help them deliver more cuts between grinds. Also equally effective for stellite and high-speed steel.

**QUICK SETTING.** The famous Prosser index device speeds setting of table to desired angle. Table need never be raised or lowered—and once set, it stays put.

**MORE WORK PER WHEEL.** Easy compensation for wheel wear. Wheel face can be kept close to edge of table . . . wheels can be used up practically 100%. Fewer wheel changes, more time and money saved.

Prosser Carbide Grinders are made in bench and floor models, for rough grinding and fine finishing, wet or dry. Chip-breaker and drill-grinding attachments.

Write for literature on money-saving Prosser Grinders—designed by the same Prosser engineers who introduced cemented carbide to American industry.



**Model AA**  
for dry  
grinding

**Model EE**  
for grinding  
dry or wet

**Dealerships Available**

Established  
**1845**

**THOMAS PROSSER & SON**

120 Wall Street, New York 5, N. Y.

## SOUTH BEND 10" Precision Lathes

The 10" Swing, 1-inch Collet Capacity South Bend Precision Lathe is engineered for the most exacting close-tolerance machine work. The direct belt drive to the carefully balanced spindle assembly provides smooth, vibration-free speeds up to 1357 r.p.m. Slow speeds for heavy cuts on large diameters are driven through back-gears. Full quick change gear equipment makes any of 48 different threads and 48 different feeds instantly available.

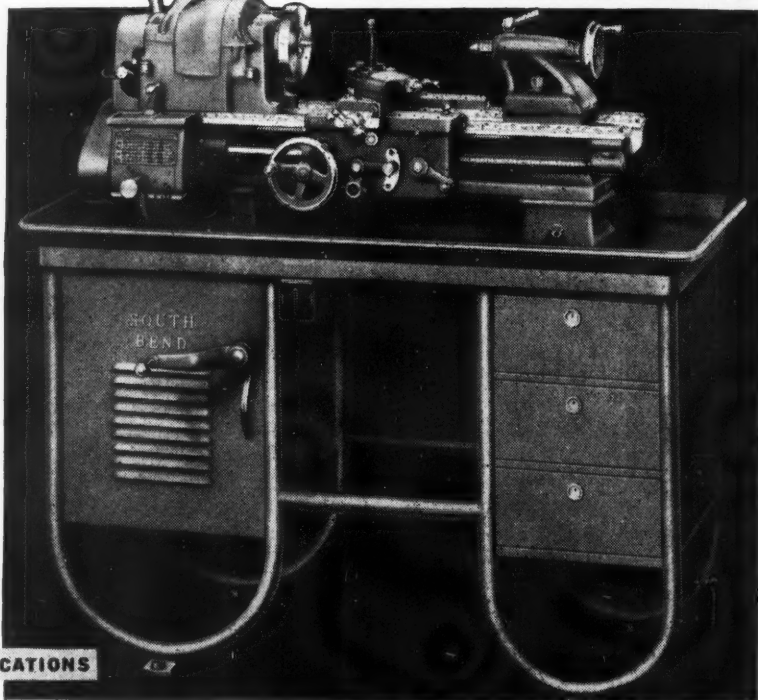
The precision, speed, and versatility of this lathe assures an efficient output on toolroom or manufacturing jobs. The 1-3/8" bore through the headstock spindle makes it especially suited for machining parts from bar or tube stock. A complete line of practical attachments greatly simplifies tooling the lathe for a wide variety of operations. Write for information on South Bend 10" Lathes and the NEW 14" Drill Presses. Immediate delivery. Time Payment Plan.



### SOUTH BEND LATHE WORKS

Building Better Tools Since 1906

427 E. MADISON ST., SOUTH BEND 22, IND.



#### SPECIFICATIONS

Catalog No. 187-Y5 South Bend 10" - 1" Collet capacity Quick Change Gear Bench Lathe Illustrated. Price — f. o. b. factory with 3 phase, 60 cycle, 220 Volt, A. C. motor; drum switch; and bench . . . . .

**\$93360**

**SWINGS:** 10 1/8" over bed and saddle wings, 5 3/4" over saddle cross slide.

**BED LENGTHS . . .** 3, 3 1/2, 4 and 4 1/2 feet

**COLLET CAPACITY . . .** 1 inch

**CENTER DISTANCE . . .** 14 3/4 to 32 3/4 inches

**SPINDLE BORE . . .** 1 1/8 inches

**12 SPINDLE SPEEDS . . .** 50 to 1357 r.p.m.

**CROSS SLIDE TRAVEL . .** 5 1/2"

**POWER LONGITUDINAL FEEDS:** 48 R.H. or L.H. . . . .0015" to .0836"

**48 POWER CROSS FEEDS . . . .** .0006" to .0309"

**THREAD CUTTING:** 48 R.H. or L.H. pitches, 2 to 224 per inch



**FOR TOOL ROOM  
OR  
PRODUCTION LINE**

**B**uilt carefully to provide the required accuracy for fine tool room work Footburt sensitives are designed with the weight and stability to maintain close tolerances on day after day production work. The correct speed for a wide range of drilling, reaming, and counter-boring operations is instantly available. Write for full information on this great line of sensitive drilling machines.

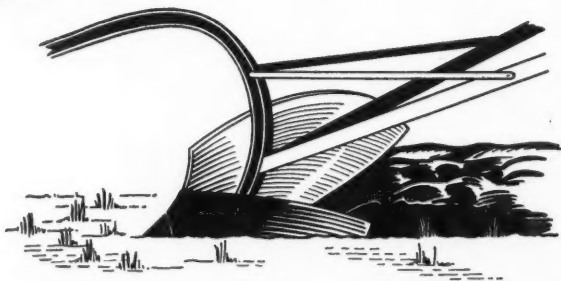
**THE FOOTE-BURT COMPANY**  
CLEVELAND 8, OHIO  
Detroit Office: General Motors Building



**FOOTBURT**

*Sensitive*  
**DRILLING MACHINES**

# A tap is like a plow..



## ... IT'S ALMOST IMPOSSIBLE TO LUBRICATE



**THAT'S WHY  
DETROIT  
TAPS ARE MADE  
OF M-11  
CHROME-COBALT  
H.S.S.**

*The Home of*  
"M-11"  
CHROME-COBALT  
H.S.S. TAPS, THREAD  
MILLING CUTTERS &  
THREAD GAGES

The cutting edges and faces at the tip of the thread on a tap are "buried" in the metal on three sides. It's almost impossible to get lubricant to those points. Furthermore, cutting is continuous.

That makes thread cutting one of the toughest jobs there is in metal cutting, and is a major reason why Detroit taps are made of that toughest of tap steels—M-11 chrome-cobalt H. S. S.

The cobalt gives Detroit taps greater uniformity and higher red hardness.

Chromium gives Detroit taps greater toughness, for less breakage; deeper hardness penetration, corrosion resistance and **GREATER RESISTANCE TO ABRASION.**

And back of every M-11 tap, thread milling cutter and thread gage is a service record which can make the proud claim:

**WE'VE NEVER "SHUT DOWN" A LINE YET!!**

**DETROIT**  
TAP & TOOL CO.  
8432 BUTLER STREET • DETROIT 11, U. S. A.



# Underwood tackles HIGH BREAK-EVEN POINT

The Underwood Corporation of Hartford, Conn., is completing a far-sighted program to eliminate production inefficiencies in the manufacture of their world famous typewriters and business machines. Obsolete equipment is being replaced by fully automatic machine tools.



## ON THIS PART



This type bar segment was formerly machined by 6 operators on 4 turret lathes, 2 engines and 1 special grooving machine. These 7 machines and 6 operators were replaced by 1 New Britain Model 88 Automatic Chucking Machine.



### RESULT

- Production increased from 90 to 120 pieces per hour
- Labor costs reduced 85%
- Quality of part greatly improved with tolerances held under 0.001"

## ARE YOU MISSING THE BOAT

You can't afford to overlook the possibilities of lowering your break-even point in a similar manner. The parts you are now producing in your plant may well be produced cheaper and better on a New Britain Automatic.

The parts described in our new *Cost History* file were money-losers until New Britain engineering turned them into money-makers. Let us send you your free copy.



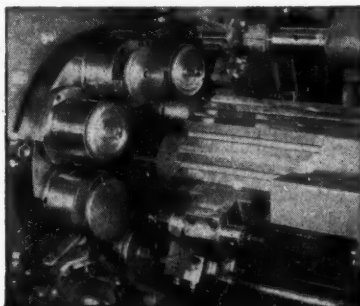
**NEW BRITAIN AUTOMATICS**  
**COST LESS PER FINISHED PIECE**

## NEW BRITAIN

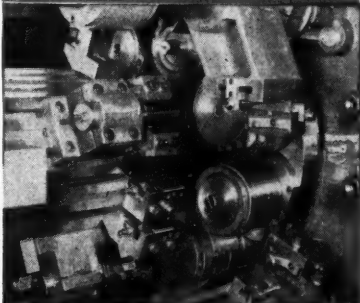
*Automatics*

THE NEW BRITAIN MACHINE COMPANY  
NEW BRITAIN-GRIDLEY MACHINE DIVISION  
NEW BRITAIN, CONNECTICUT

648HD2



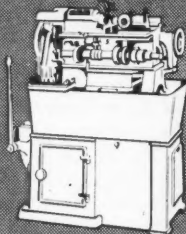
The operations are finishing the O.D., facing both contoured sides, machining the I.D. of the hub, and trepanning wire grooves in one face. Simultaneous completion of both sides was made possible by arranging the machine for double index.



48-056

# TOP PRODUCTION TEAM

for HIGH Accuracy  
and LONG Runs



AUTOMATIC SCREW MACHINES... *PLUS*



A



B

**Staples**

**CARBOLY-TIPPED**  
CEMENTED CARBIDES

## STUB SCREW MACHINE REAMERS

Staples stub screw machine reamers cut production costs on automatic screw machine operations by eliminating frequent down time for reamer sharpening. Carboly surfaces are highly resistant to wear—far exceed I.L.S.S. on tool life. Tools hold accurate diameters, permitting long runs on exceptionally close tolerance work.

These reamers are made both in solid and expansion types. Tools are stocked semi-finished and are ground to size specified with tolerance of .0003" on diameter. A complete range of sizes is available for immediate delivery.

(A) Staples Carboly-tipped Expansion Stub Screw Machine Reamer.

Staples patented expansion principle permits easy adjustment of tool to .0001". Expansion plug limited to 3/32" extension beyond tool end (width of cut-off blade) eliminates possibility of plug striking bottom of drilled hole. Can also be furnished with plug flush with tool end if specified.

(B) Staples Carboly-tipped Solid Stub Screw Machine Reamer.

**THE STAPLES TOOL COMPANY**

CINCINNATI 25, OHIO

Distributors in Major Cities

*write for your  
complete  
Staples Tool  
catalog*

**Staples**

**CARBOLY CEMENTED CARBIDE TOOLS**

A COMPLETE LINE OF SINGLE AND MULTIPLE POINT CUTTING TOOLS  
EXPANSION REAMERS • FORM TOOLS • CENTERS • MASONRY DRILLS • SPECIAL TOOLS

An IDEAL

Combination



## GARDNER / GRINDER

### WORK DATA

Part Brake Shoes  
Material Brake Lining  
Operation Grind Outer Diameter  
Tolerances .010" for Uniformity  
Stock Removal .015" to .020" Maximum  
Production 20 to 30  
Pieces per Hour  
Feed Hand Load and Unload  
to Rotating Fixture  
Machine Gardner "230-30" Grinder

### for MODERATE Production

Many manufacturers have a wide variety of flat-surfacing jobs — with only moderate volume on most operations. For plants of this kind, the No. 230-30" GARDNER GRINDER is ideal. It may be equipped with a special hand-operated table on one end, and a standard lever-feed table, for miscellaneous flat surface jobs, on the other.

In the photo above, it is grinding brake shoes with the lining attached, on the special table, with the other table free for any general-purpose work.

You can use this ideal combination grinder to flat-surface dozens of parts —

Write for descriptive bulletin!

GARDNER - GRIND  
YOUR Flat SURFACES

## GARDNER MACHINE COMPANY

428 East Gardner Street \* \* \* Beloit, Wisconsin, U.S.A.

# *NEW* MICROMATIC MECHANICAL MICROHONER MACHINE Model 717

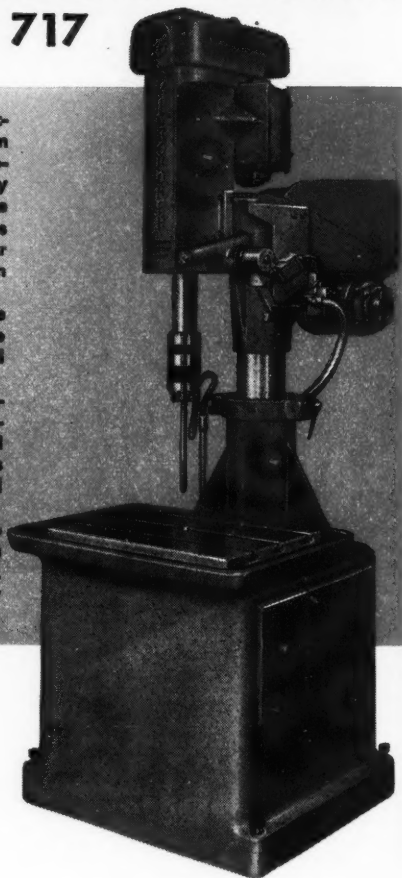
**T**HE full benefits of Microhoning accomplishment for salvage, tool room and semi-production work are provided in this new all-mechanically actuated machine. It is designed to Microhone to desired standards a wide variety of types and sizes of bores from 1/2 to 4-in. in diameter up to 7-in. maximum lengths, with a minimum number of tools and fixtures.

It is small and compact, but sturdily built. The table is integral with the cast iron base; the head is adjustably supported on a round, rigid column providing accurate alignment.

Full working usefulness of the adjustable, positive stroke is assured by an extra manual lift-out stroke. Cost of tooling is minimized, and complete operator control of tool expansion is possible because the adjusting head is mounted on, but does not rotate with the spindle.

Adaptability to parts of any material or type within the size range is assured by selection from six rotation and four reciprocation speeds.

Standard electrical equipment is located for quick service and maintenance accessibility.



## *Specifications*

- For bore diameters . . . 1/2 to 4-in.
- For bore lengths . . . Up to 7-in.
- Stroke . . . 6-in.
- Liftout . . . 3 1/2 in.
- Spindle to table, max. . . 24 11/16-in.
- Spindle to table, min. . . 7-in.
- Spindle to column . . . 11-in.
- Rotation speeds, r.p.m.  
1058-742-505-334-234-159.
- Spindle reciprocations per min.  
278-139-93-69.



Microhoning Machines, Microhoning Tools, Microhoning Fixtures, and Microhoning Abrasives

District Field Offices: 1323 S. Santa Fe, Los Angeles 21, California. Phone: Tucker 3756 • 194 Delhousie St., Brantford, Ontario, Canada. Phone: Brantford 1128 • 616 Empire Bldg.,

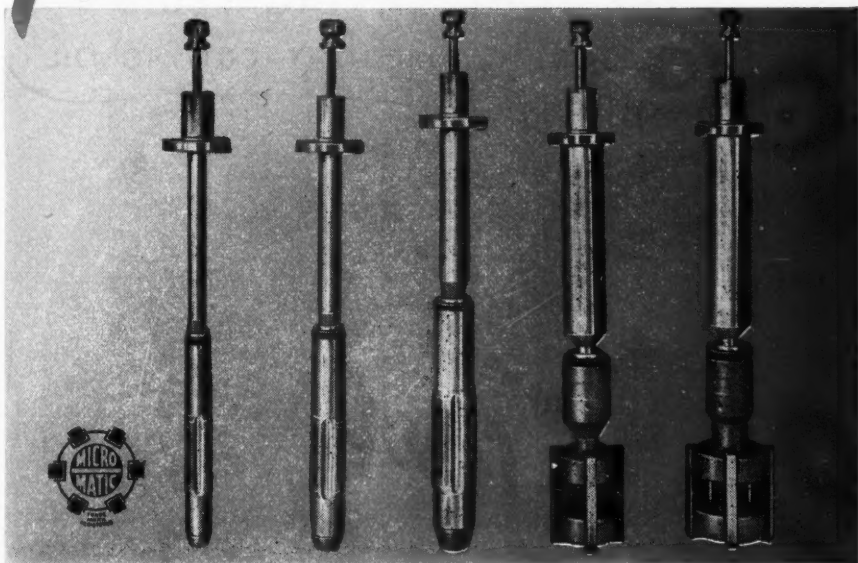
## **MICROMATIC**

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# NEW MICROMATIC

## MICROMOLD\* UTILITY TOOLS



To extend the usefulness of Microhoning to short run and odd lot production use, a set of five tools is now available which, with some extra sets of stoneholder assemblies, cover the range from 1-in. to 4-in. diameter work. They provide all the expansion and operating controls of former general service type tools, with some added improvements for more economical operation in general purpose use.

They use newly developed Micromold abrasive assemblies, in which the abrasive sticks are mounted in plastic, molded in graduated heights and shaped to simulate the conventional production tool stone and stoneholder assemblies. This reduces the number of wearing parts in the tool, and makes it easy to change the Micromold assemblies for any change in bore size being Microhoned.

### Specifications

Diameter	Lengths	Micromold Sticks		
		Sets	Stones set	Length
1" to 1 1/4"	2" to 6 1/2"	2	4	1 3/4"
1 1/4" to 1 3/8"	2" to 6 1/2"	3	4	1 3/4"
1 3/8" to 2"	2 1/2" to 6 1/2"	3	4	2 1/4"
2" to 2 3/4"	3" to 7 1/2"	4	4	3"
2 3/4" to 4"	3" to 7 1/2"	5	5	3"

\*REG. U. S. PAT. OFF.

## HONE CORPORATION 3100 Schoolcraft Avenue DETROIT 4, MICHIGAN

206 So. Main St., Rockford, Ill. Phone: Forest 1128 • 927A - M & M Bldg., P. O. Box 981, Houston 2, Texas.  
Phone: Preston 2381 • Room 514—129 Church St., New Haven 10, Conn. Phone: New Haven 7-0035.

WANT LONGER TOOL LIFE  
... LESS DOWN TIME?  
IT'S BEING DONE WITH **LUSOL**  
**THE TOOL SAVING FLUID**  
SUCCESSOR TO ORDINARY CUTTING OIL  
AND SOLUBLES



**THE NEW DAY COOLANT  
THAT SPEAKS FOR ITSELF**

The word is spreading . . .  
a trial will convince you

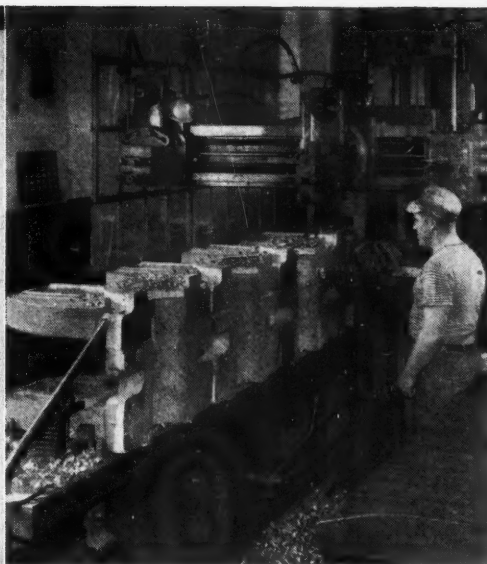
*write - wire - phone*

**F. E. ANDERSON OIL COMPANY**

512 BROWNSTONE AVE.

PORTLAND, CONNECTICUT

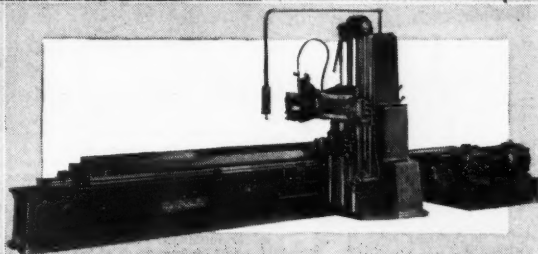




**Simplified Control**  
**Quick Set-up**  
**Fast Operation**  
**Stepless Speeds**  
**Smooth Cutting**  
**Fast Reversals**  
**Long Tool Life**  
**Because It's**  
**HY-DRAULIC**

## **Rockford Hy-Draulic**

**Shaper-Planers**  
 Built in five standard sizes with table stroke lengths ranging from 42" to 144". Shaper-Planers are equipped to your specifications with single or double cross rail head... and with side rail head.



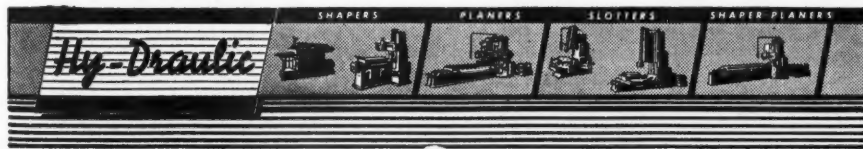
### **FASTER WORK on the "In-between" jobs . . . . .**

Because it's Hy-Draulic, the Rockford Shaper-Planer will give you faster work, on every type of shaper-planer job. The steel castings being machined above represent a typical application... work that is too small for standard planers, yet too large for shapers.

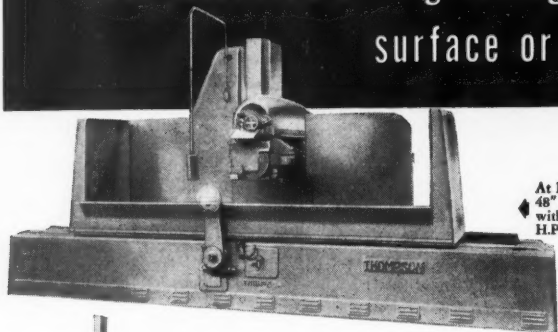
The reasons are many why Rockford Hy-Draulic Shaper-Planers hold "floor-to-floor" time to a minimum. Controls are centralized

and responsive, speeding up both set-up and actual machining time. Cutting strokes may be quickly set for *any* length and speed required within capacity limits... reversals are fast. To help decrease your overall machining costs, we suggest you get the facts on Rockford Hy-Draulic Shaper-Planers. Ask for Bulletin 445.

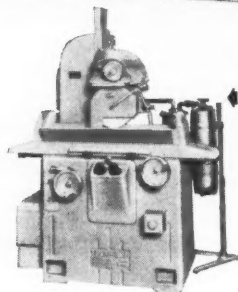
**ROCKFORD MACHINE TOOL CO.**  
**ROCKFORD ILLINOIS**



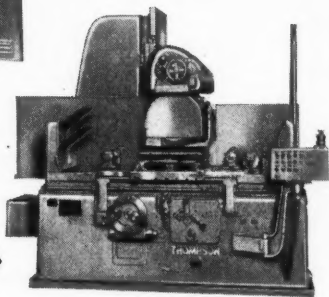
# *Investigate* the complete line of Thompson Machines **FOR SAVINGS** in grinding every flat surface or contour



At left—Thompson Heavy Duty Type CX 36" x 48" x 120" Hydraulic Surface Grinder. Equipped with super precision spindle powered with 40 H.P. motor.

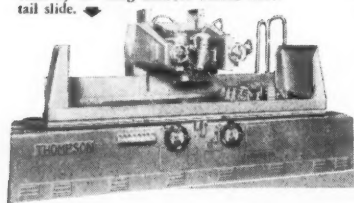


At left—Thompson Type "F" 6" x 10" x 18" Hydraulic Surface Grinder. This machine is arranged to utilize a new principle of applying coolant to the grinding wheel. All of the coolant is applied through the grinding wheel making it possible to grind exceedingly thin sections without burning or warping the work.

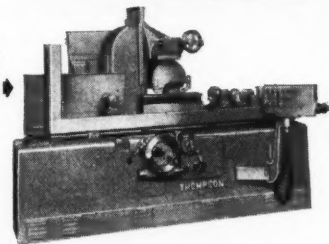


At right—Thompson Type "C" 16" x 16" x 36" Truforming Grinder. The latest design of a Truforming (Crushed Wheel Grinding) machine arranged with Thread Roll Die Grinding Fixture equipped with 20" dia. x 6" face wheel driven by 30 H.P. motor.

Below—Thompson 12" x 11" x 48" Dovetail Way Grinder, designed to eliminate the expensive job of hand scraping machine tool dovetail way bearings. The machine illustrated has capacity for a 12" wide by 48" long male or female dovetail slide.



At right—Thompson Type "B" 12" x 11" x 36" Truforming Grinder. A new design of a popular Truforming (Crushed Wheel Grinding) machine arranged for production grinding of intricate contours.



**WRITE TODAY  
FOR NEW BOOKLET  
ON TRUFORMING**

**Thompson**  
SURFACE  
Grinders

**The Thompson Grinder Co., Springfield, Ohio**

How to get prompt delivery on LYON metal products

ANOTHER  
LYON CONTRACT ITEM  
MADE TO  
Manufacturers' Specifications

Another  
**LYON**  
METAL PRODUCT

**YOU**  
FURNISH THE STEEL

**LYON** WILL MAKE THE PRODUCT

Regular delivery of Lyon products — either standard or special — is geared to the available supply of sheet steel. But . . .

If you can supply us with 12 to 24 gauge sheet steel, we will buy it from you and promptly ship the pound-for-pound equivalent

at regular published prices . . .

**EITHER** . . . Lyon standard products now in production (see partial list below) . . .

**OR** . . . assemblies, subassemblies, parts, etc., for your product. These would be made to your specifications in gauges from 8 to 30.

## **LYON** METAL PRODUCTS, INCORPORATED

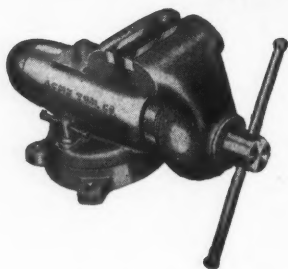
General Offices: 638 Monroe Avenue, Aurora, Illinois  
Branches and Dealers in All Principal Cities

### A PARTIAL LIST OF LYON PRODUCTS

- |                        |                     |                    |                |                     |                  |
|------------------------|---------------------|--------------------|----------------|---------------------|------------------|
| • Shelving             | • Kitchen Cabinets  | • Filing Cabinets  | • Work Benches | • Tool Stands       | • Tool Trays     |
| • Lockers              | • Display Equipment | • Cabinet Benches  | • Drawer Units | • Service Carts     | • Desks          |
| • Wood Working Benches | • Hanging Cabinets  | • Folding Chairs   | • Conveyors    | • Hopper Bins       | • Stools         |
| • Economy Locker Racks | • Welding Benches   | • Drawing Tables   | • Shop Boxes   | • Parts Cases       | • Tool Boxes     |
|                        |                     | • Storage Cabinets | • Bar Racks    | • Flat Drawer Files | • Sorting Files  |
|                        |                     | • Bench Drawers    | • Bin Units    |                     | • Ironing Tables |

# PRACTICALLY INDESTRUCTIBLE!

ACME BENCH VISES have ALL these features



**Maximum Gripping Power**

**Longer Vise Life**

**No Side Twist or Wobbling**

**Unbreakable Sleeve Nut**

**Interchangeable Ground Jaws**

**Swivel Base**

**11 Sizes from 2" to 6"**

Also Acme Combination Pipe and Bench Vises with same outstanding features available with  $4\frac{1}{2}$ " wide jaws. Holds pipe  $\frac{1}{8}$ " to  $3\frac{1}{2}$ ".

• • • • • Delivery from Stock • • • • •

## NUPLA MALLETS

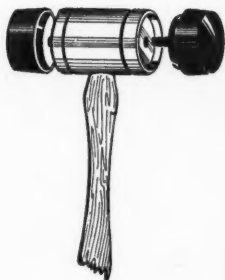
*With Interchangeable Tips*

Nupla Mallet Tips give you tough, resilient and self-healing qualities that no other mallet possesses. Made in three grades, "S" — Soft, "M" — Medium, "T" — Tough.

Will not mar machined or delicate surfaces. No "Flying Particles" to endanger workmen's eyes. No sting, vibration or rebound.

No explosion or fire hazard.

Can be had non-conductor of electricity (specify when ordering).



**"A Mallet for Every Purpose, A Purpose for Every Mallet"**



**PRECISION  
REDUCTION  
TOOLS**

**ACME TOOL  
COMPANY**

69 WEST BROADWAY

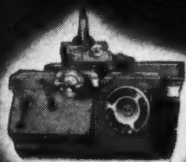
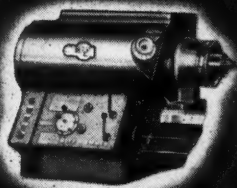
NEW YORK 7, N. Y.

# It has everything

**MOST QUIET, VISIBLE, ACCESSIBLE  
25 INCH LATHE EVER DESIGNED  
16 SPEEDS 7-500, AND 64 FEEDS**



The down pressure of the back gear at the front (see diagram) counteracts the upward lift of the tool, eliminating chatter inherent in lathes which have a double lift on the spindle — by the tool on one side and back gear on the opposite side.



Imagine! Speed and feed dials can be read by operator or foreman standing 15 feet to the left. Speed and feed tables are read without squat, squint, or stoop, and controls are more accessible because gear box has been sloped.

Sloped apron makes controls more accessible. Hand wheel is easier operated by right hand. Large dials are direct reading. Compound rest dial is mounted at an angle preventing interference with cross feed handle.

Tailstock slide adjusting handwheel travels with center and is in easy reach. When carriage is near center of bed all operating controls can be reached with a single step in either direction saving the operator lots of effort in a day's time.

## BOYÉ & EMMES

**MACHINE TOOL COMPANY**

117 Caldwell Dr., Cincinnati 15, Ohio

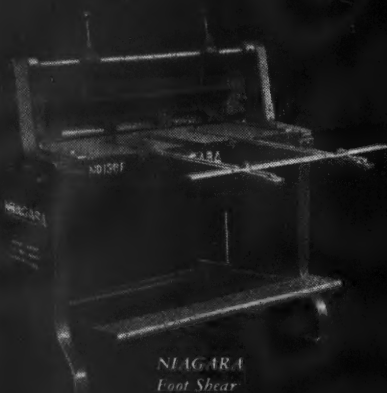


You'll need this bulletin. Please write on your firm letterhead.

# NIAGARA

*America's Most Complete Line of*

**MACHINES AND TINNERS' TOOLS**  
**FOR PLATE AND SHEET METAL WORK**



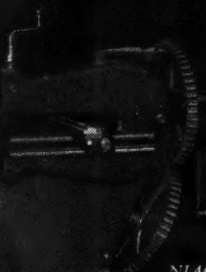
NIAGARA  
Foot Shear



NIAGARA  
Slip Roll Former



NIAGARA



NIAGARA  
Ring and Circle Shear



NIAGARA  
Crimper and Beader

NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, NEW YORK DIST



# NIAGARA

The tinner's tools and machines shown on these pages are just a few of the hundreds included in the complete Niagara line. There is an economical, productive and reliable press, shear, machine and tinner's tool for every requirement for sheet metal job shops, plant maintenance departments and high production plants. Niagara hand, foot and power operated machines offer low first cost, low production cost and low maintenance cost. Write for catalogs.

NIAGARA  
Combination  
Bench Machine

NIAGARA  
Letter Punch & Shear

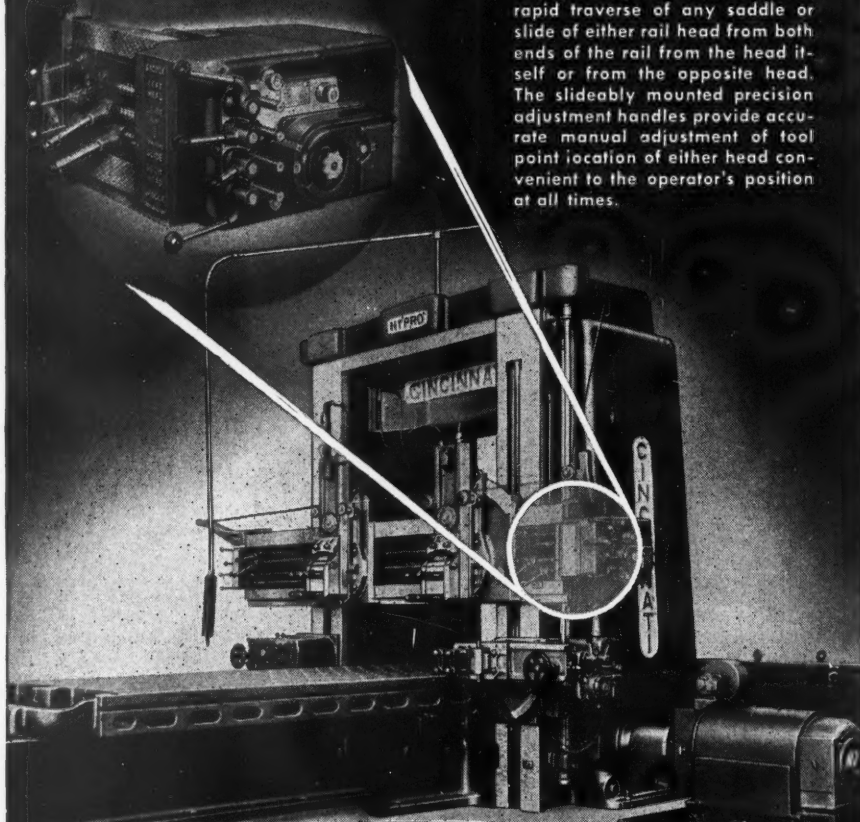
NIAGARA  
Grinder

NIAGARA  
Electric Combination  
Machine

NIAGARA  
Folder

**NOW** WITH THE NEW, MORE EFFICIENT  
**CINCINNATI Hypro Dual Saddle Control**  
**and Precision Adjustment Handles**

... it is possible to engage or dis-engage independently the feed or rapid traverse of any saddle or slide of either rail head from both ends of the rail from the head itself or from the opposite head. The slideably mounted precision adjustment handles provide accurate manual adjustment of tool point location of either head convenient to the operator's position at all times.



**THE CINCINNATI HYPRO PLANER COMPANY**

PLANERS · BORING MILLS · PLANER TYPE MILLERS

CINCINNATI, OHIO

# You Get *Easier Set-Ups*



and  
*Effortless  
Operation*  
with the

## TAFT-PEIRCE

No. 1 Precision Surface Grinder



Because the Taft-Peirce No. 1 Precision Surface Grinder has full ball-bearing construction and hardened and ground steel V-ways, operation is smooth and effortless, wear is reduced to a minimum, and accuracy is maintained.

Specially designed to produce surfaces which are flat within extremely close limits of tolerance, this surface grinder eliminates many complicated tool set-ups. Equipped with the exclusive Taft-Peirce Tilting Wheelhead, which can be set to any angle from horizontal to 30° below center, it speeds up and simplifies difficult angle and shoulder grinding. For any work up to 5" x 12" x 12", this unique

surface grinder will save you both money and time in grinding tools, gages, and precision parts.

Write for illustrated bulletin.

**The TAFT-PEIRCE Mfg. Co.**

Woonsocket



Rhode Island

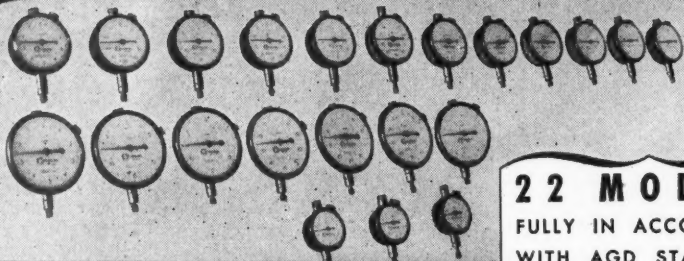
**T-P means TOP PRECISION**

**YOUR CHOICE  
To Fit Your Job**



**STANDARD**

*Dial Indicators*



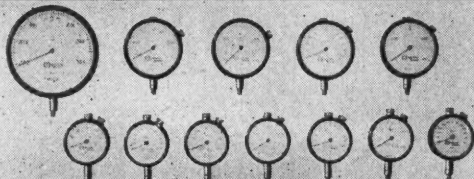
**22 MODELS**

FULLY IN ACCORDANCE  
WITH AGD STANDARDS

*Regular Series*

**12 MODELS**

FOR FINE TOLERANCE CHECKING,  
AGD MOUNTING DIMENSIONS,  
MARKED IN DECIMALS. MODIFIED  
RANGE. RED HANDS.



*Decimatic Series*



**10 MODELS**

STEM PERPENDICULAR TO DIAL  
FIT MANY FIXTURE APPLICATIONS

*90° Models*

10-TURN MODELS FOR  
EXTRA LONG RANGE  
APPLICATIONS.



3" STEMS PERMIT  
CLOSE SPACING

*Long Range and Long Stem Models*



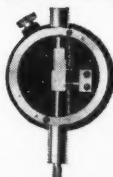
**Micronar  
INDICATOR**

Graduated .00002" or .001mm.

**For Super-Fine Checking  
Including Gages**

**SHOCKPROOF  
MECHANISM**

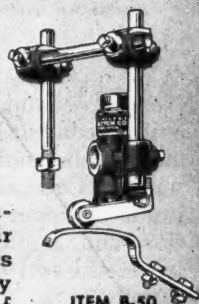
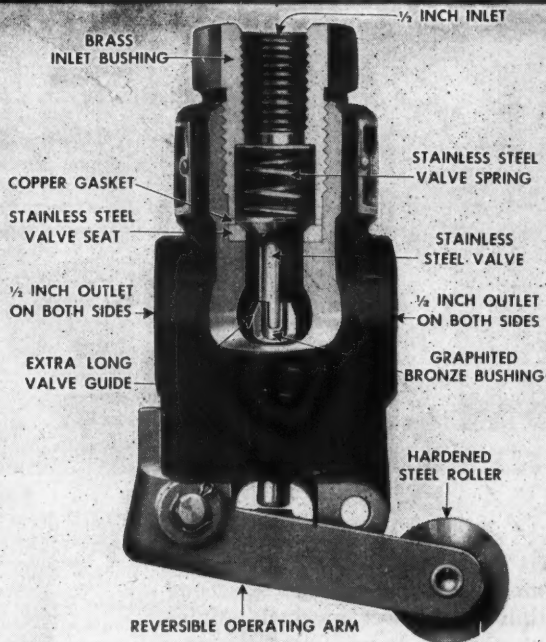
Not a special purpose item, but  
furnished regularly in most models.  
Even for ordinary spindle thrusts,  
often repeated, it prolongs instru-  
ment life by isolating shocks.



**STANDARD GAGE CO., Inc., Poughkeepsie, N.Y.**

INCREASE MACHINE TOOL EFFICIENCY with

# *Palmer Shile* **AIR SAVER** *Leak Proof* **AIR VALVE**



ITEM B-50

Complete Assembly  
includes Valve,  
Mounting Rods,  
Operating Cam.

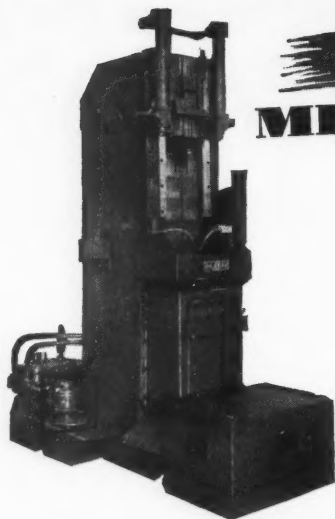
**\$12<sup>50</sup>**

A real precision-built, leak-proof air valve that completely harnesses air power and assures split-second air control at all times. The easy-to-install Air Saver mounts in any position—operates at any angle—unaffected by vibration—provides ample air volume for operation of single or multiple jets. A natural where air is used for cleaning, drying, cooling, positioning or ejecting. Especially recommended around punch presses, die casting machinery, drill presses—and in reaming, broaching and other operations. *Immediate Delivery.*

Item B-100 (Valve Alone) \$10.00

# *Palmer Shile Co.*

16022 FULLERTON AVE. • DETROIT 27, MICH.



## MEMO

*to users of  
metal working  
equipment ...*

The new features recently installed on all Ruthman Gusher Coolant Pumps increase efficiency, prolong life expectancy, and reduce maintenance cost.

# RUTHMAN GUSHER COOLANT PUMPS

*Illustrated is an Oilgear Type XP Vertical Broaching Machine equipped with a 1/2 HP Model TL-7320 Gusher Coolant Pump.*

Photo courtesy  
Oilgear Co.

New type end-bell on totally enclosed motor has built-in conduit box with ample capacity to accommodate the multiple lead wires of dual voltage stators. Concealed through-bolts fastened from inside of upper end-bell give drip-proof construction and improved appearance. Oversized pre-lubricated ball bearings eliminate oilers or grease fittings.

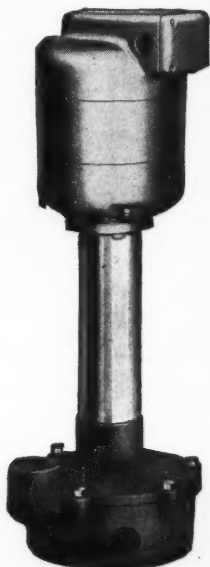
*Write now for Catalog 10-F.*

**THE RUTHMAN MACHINERY CO.**

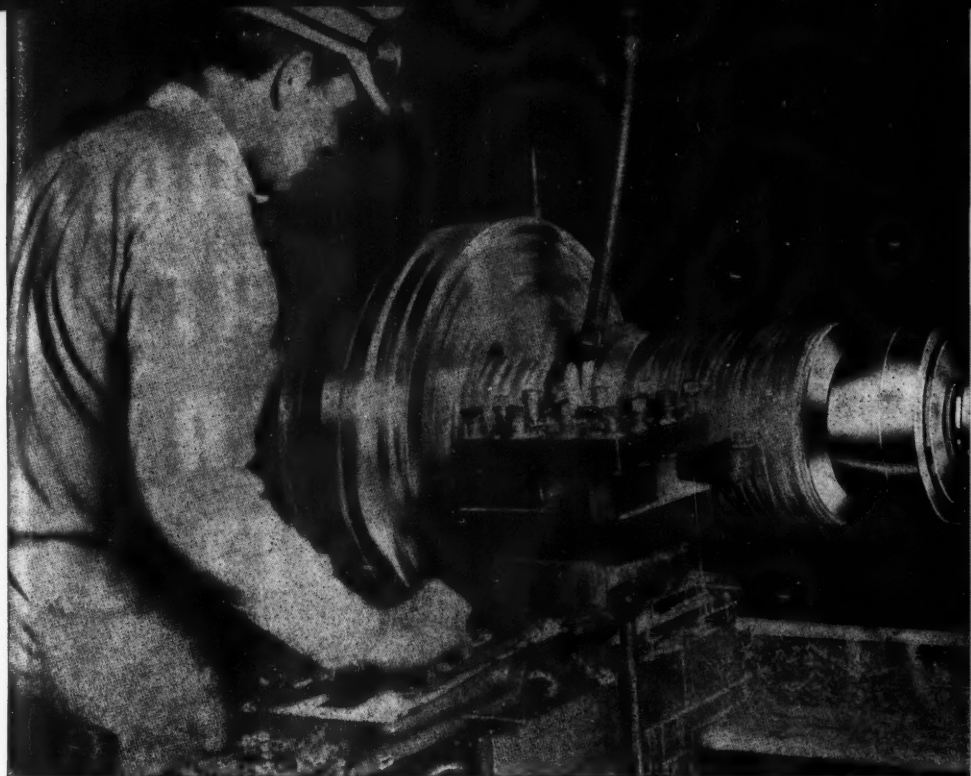


1817 Reading Road

Cincinnati 2, Ohio

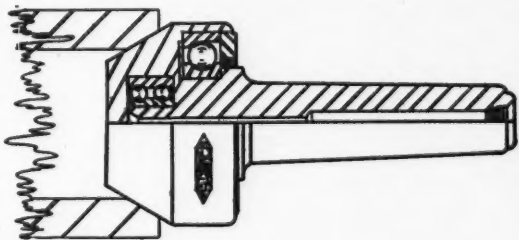






## LIVE CENTER *adapted to Tube Turning*

• The basic design of the STURDIMATIC Live Center is ideally adapted to tube turning . . . extra large sections are no problem with this set-up . . . in most of these cases (see mechanical drawing) there is a tool clearance . . . Characteristic of all STURDIMATIC design is this low overhang which together with a slight cushioning action, that compensates for expansion, due to heat, shock and excessive thrust loads—reduces wear to a minimum . . . we will see that your job gets set-up with the right LIVE CENTER . . . STANDARDS with Morse tapers (2 to 6) carried IN STOCK.



Special LIVE CENTER for turning extra large tubing.

# STURDIMATIC

**TOOL COMPANY**  
5222 THIRD AVENUE, DETROIT, MICHIGAN  
**LIVE CENTERS**

**IMPROVED** for higher operating efficiency

IMPROVEMENTS  
START  
HERE



**NEW WHEEL SPINDLE FEATURES**

- Choice of two styles—  
*Plain-Bearing* with automatic compensation for wear.  
*Antifriction-Bearing* with sealed grease lubrication.
- Simplified V-belt drive with guard. Three wheel speeds.
- Upright base graduated to 110° each side of zero.

**BROWN &**

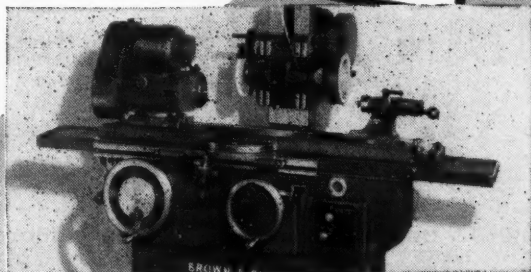
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# ...the **NEW DESIGN No. 13** UNIVERSAL & TOOL GRINDING MACHINE

## BETTER PERFORMANCE STARTS HERE

This general-purpose machine embodies many outstanding refinements... engineered to simplify set-ups, increase its versatility, and prolong its service life. Automatic lubrication now protects all major mechanisms and bearing surfaces.

Here's your opportunity to increase the efficiency of tool room grinding of small-to-medium sized work. *Capacity:* centers swing 8" in diam.; take 24" in length.

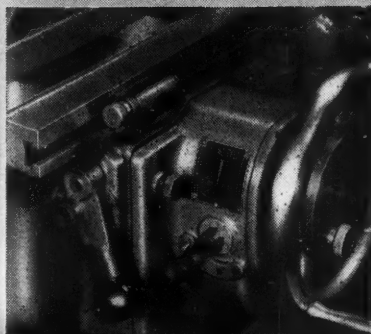


### MOTOR-DRIVEN HEADSTOCK

- ✓ 4 work speeds for dead-center or revolving spindle grinding.
- Headstock spindle mounted on preloaded anti-friction bearings.
- Angular setting to 100° each side of zero.

### NEW CORRELATION OF CONTROLS

- Related grouping of controls permits maximum output.
- 6 table speed rates, changed from front of machine.
- Start-stop lever, for headstock spindle and power table movement or headstock only.



### *Checklist* OF IMPROVEMENTS

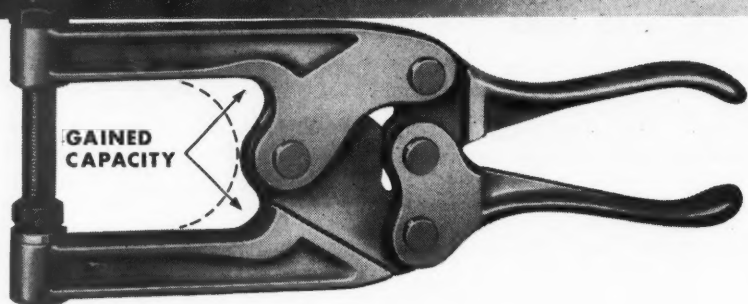
- ✓ Improved Wheel Spindle and Headstock
- ✓ 6 Table Speeds
- ✓ Individual Motor Drive for Table
- ✓ New "Bumping" control for Table Adjustment
- ✓ 4 Changes of Work Speeds
- ✓ Automatic Lubrication
- ✓ Built-in Electrical Controls meet MTE Standards.

For complete  
information,  
write  
Brown & Sharpe  
Mfg. Co.,  
Providence 1,  
R. I., U. S. A.

# SHARP

BS

**GREATER THROAT CAPACITY  
LARGER SPINDLE  
HIGHER APPLIED PRESSURE**



## IN *2 New* KNU-VISE PLIERS

● Square opening utilizes full depth of throat gap. Spindle size increased from  $\frac{5}{16}$ " to  $\frac{3}{8}$ " to give more stiffness and surer grip. Spindles now also available in copper to prevent adhesion of weld spatter. Improved handle design for greater comfort. Model P-1200 provides 1200 pounds clamping pressure, with throat capacity  $1\frac{9}{32}$ " x  $2\frac{1}{4}$ ". Model P-1800 provides 1800 pounds clamping pressure, with throat capacity  $1\frac{9}{32}$ " x  $1\frac{1}{4}$ ".

All Knu-Vise clamps are characterized by the toggle-action locking grip which can be applied and released instantly with normal hand pressure. There is a Knu-Vise Clamp to meet every clamping requirement.

Send for catalog describing these welding, drilling and riveting aids that bring economy and increased efficiency to your production.

**KNU-VISE  
PRODUCTS**

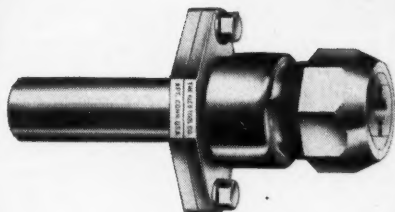
**LAPEER MANUFACTURING CO.**  
3056 DAVISON ROAD • LAPEER, MICHIGAN

# ALCO

## RELEASING MODEL TAP HOLDER



Please write for  
new complete  
Catalog No. 6.



The operator of hand-drew machines and turret lathes has but one thought in mind — to produce perfect work with the minimum amount of effort.

ALCO Releasing Type Tap Holders lend themselves admirably to making this an established fact. The solid clutch drive, the concentric alignment of the tap with the hole, the rugged construction of the ALCO tool make this the most outstanding and fool-proof tap holder of all the releasing types. Designed especially for heavy duty work and for cutting threads to the most exacting standards.

The quick and positive alignment of the tap for concentricity saves valuable time in setting up and the fact that wear on the tap is evenly distributed lengthens tap life and prevents breakage.

The most convincing method of proving that ALCO Releasing Tap Holders will save time and improve work produced is to install just one of them on your next set-up. Please write for complete engineering data and prices.

# ALCO TOOLS

## THE ALCO TOOL CO.

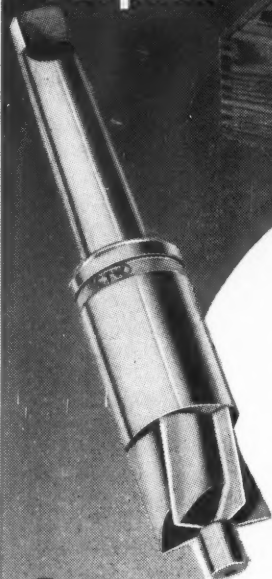
132 Birdseye St., Bridgeport, Conn.

Detroit Office: 908 Stephenson Bldg.



# Continental COUNTERBORE SETS

A Size  
For Every  
Purpose



THE indestructible drive and rigid, yet simple, construction of the Continental Interchangeable Counterbore assure long dependable service.



CONTINENTAL Interchangeable Counterbores are now available in a choice of three sets, each providing a wide variety of useful, dependable tools. In complete yet compact form, you will find a selection designed to fill the needs of the large or small toolroom. Set No. 1 (illustrated), for the small shop, includes cutters up to  $1\frac{1}{16}$ " diameter, with two holders. Whichever set you choose, you will get fine, precision-made cutting tools.

**CONTINENTAL TOOL WORKS**

Division of Ex-Cell-O Corporation  
DETROIT 6, MICHIGAN



## Continental CUTTING TOOLS

- Boring Bars and Tools
- Broaches
- Broach Pullers
- Broaching Fixtures
- Core Drills
- Counterbores and Countersinks
- CTW Drive Holders
- Counterbores (Tool Room Sets)
- Counterbore Pilots
- Inserted Blade Cutters
- Carbide Tipped Cutters
- Form Relieved Cutters
- Milling Cutters
- Thread Milling Cutters
- End Mills
- Side Mills
- High Speed Steel Reamers
- Carbide Tipped Reamers
- Shell Reamers
- Inverted Spottacers
- High Speed Steel Tool Bits
- Carbide Tipped Tool Bits
- Circular Form Tools
- Cut-off Tools
- Flat Form Tools
- Dovetail Form Tools

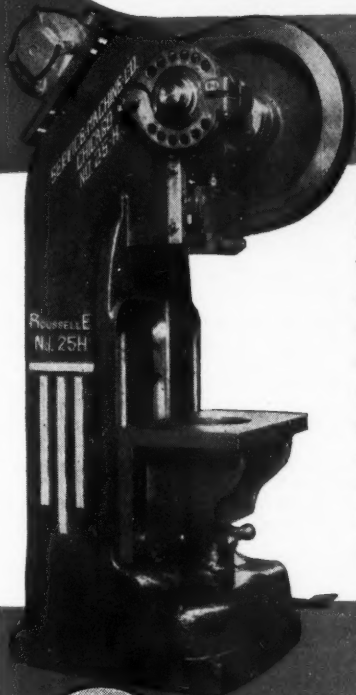
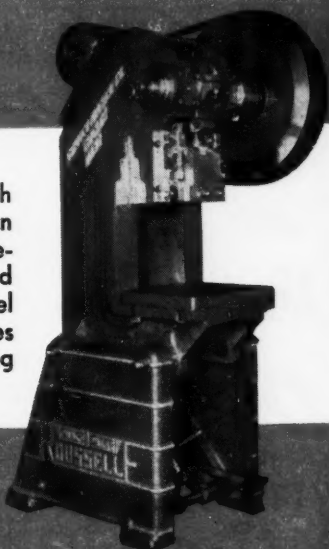
46-44



# Rousselle

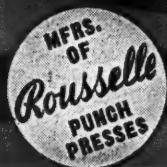
## PRESSES

● The No. 3-OBI-25 ton Rousselle Punch Press embodies features that mean high production at low cost and dependable service. Ways are hardened and ground—Roller bearing flywheel—Press is easily inclined to 30 degrees by one man operating ball bearing inclining device from front.



● This 25-ton Rousselle Horning Press with adjustable bed table can be quickly and accurately raised or lowered to suit the die to be used. Press can be furnished with special table to permit a maximum shut die height of 28". Unique design permits slugs or blanks to fall through table without interference from elevating screw.

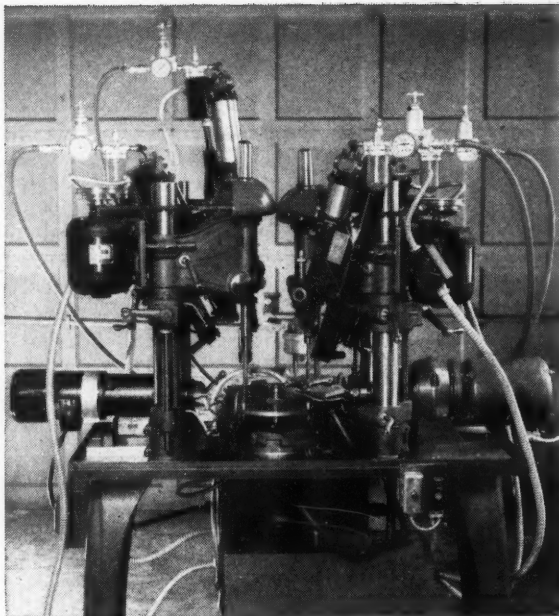
OTHER PRESSES: 5-10 TON OBI BENCH MODELS, 5-10-15 FLOOR MODELS 15-25 HORN WITH ADJUSTABLE BED...SEE YOUR DEALER OR WRITE



### SERVICE MACHINE COMPANY

7622 S. ASHLAND AVE., CHICAGO 20, ILLINOIS

**PRODUCTION**  
*UP*  
**LABOR COSTS**  
*DOWN*  
**WITH SPECIAL**  
*Atlas*  
**ADAPTATION**



Production costs *can* be cut—with engineering ingenuity *and* compact Atlas tools.

A typical example is this automatic machine developed for Bell & Gossett, Morton Grove, Illinois, by the Wales Equipment & Engineering Service, Chicago.

All the operator does is load a part on the dial and step on a floor button. Dial indexes, 4 Atlas heads (operated by Bellows equipment) come down and 2 Govro-Nelson heads come in from the sides to perform these operations:

Position No. 1 — unload a finished casting, load a rough one.

Position No. 2 — drill 31/64" Dia. center hole.

Position No. 3 — drill side hole with Govro-Nelson Model "H" unit.

Position No. 4 — drill 2 No. 31 holes with Atlas head and Ettco 2-spindle multiple drilling head.

Position No. 5 — spot face 1-9/16" diameter with Atlas head.

Position No. 6 — tap side hole 1/4-20 with Govro-Nelson Model "KT" tapping unit.

Position No. 7 — ream center hole 1/2" diameter to remove burrs from side drilling and tapping.

The machine is completely automatic. An emergency button stops it at any point and heads immediately retract.

Suggest a way you can increase production and cut costs? Complete information about Atlas drill heads, lathes, millers, shapers sent on request.



**ATLAS PRESS COMPANY**

646 NO. PITCHER ST., KALAMAZOO, MICHIGAN



This was once the  
**"LAST WORD"**  
 in hardness testers

YES, it was a real "ROCKWELL" Hardness Tester—a very early model—and a marvelous instrument in its time. It would contrast oddly with a modern "ROCKWELL" Hardness Tester. Yet there has been even more dramatic improvement in the whole science of hardness testing — due largely to the Wilson Standardizing Laboratory. Here ways are constantly being developed to make BRALE Diamond Penetrators even *more* permanently accurate—to make our test blocks even *more* uniformly dependable. In hardness testing equipment, we are not content to meet the requirements of industry. We try to anticipate them.

Also makers of the TUKON Microhardness Tester.

# WILSON

**MECHANICAL INSTRUMENT CO., INC.**  
 AN ASSOCIATE COMPANY OF AMERICAN CHAIN & CABLE COMPANY, INC.

230-A PARK AVENUE, NEW YORK 17, N. Y.

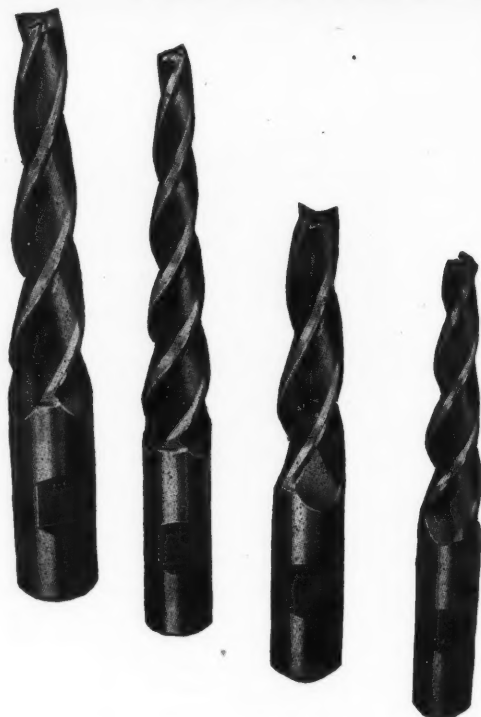


YESTERDAY'S PIONEER . . . TODAY'S LEADER

# **TAPERED END MILLS**

## **CONSTANT SPIRAL**

**(Die Sinking Cutters)**



● To the extensive line of the well known Weldon End Mills have been added Weldon Tapered End Mills, Constant Spiral. Also known as Die Sinking Cutters, these new end mills, filling a definite need, come in a wide range of sizes, giving a choice of many lengths and diameters. Weldon Tapered End Mills as standard stock items are all 3-flute, and offer a choice of  $\frac{1}{2}^\circ$ ,  $1^\circ$ ,  $2^\circ$ ,  $3^\circ$ ,  $5^\circ$  and  $7^\circ$  angles. They represent the same high quality for which Weldon End Mills are famous.

*Write for Complete List of Sizes*

# **THE WELDON TOOL CO.**

*Cleveland 4,  
Ohio*

3000 WOODHILL ROAD



## STEEL BARS AND SHAFTING

*...headed your way*



... right out of the Union Drawn Distributor's warehouse and into your plant—almost as soon as you could draw them from stock.

It's easy to use his well-filled warehouse as YOUR stockroom. You simply call him for prompt, efficient delivery from his complete, classified stocks of cold

finished steel bars and shafting. It's profitable, too. You free yourself from frozen investments, obsolete stocks, depreciation, non-paying storage space and handling and insurance costs.

Tell your Union Drawn Distributor what you need today—and what you expect to need in the future. He'll do his best to see that a steady supply of steel bars is *headed your way*.



*Republic* UNION  
COLD DRAWN STEELS

**MORE THAN 9000**

**Bridgeport**

**TURRET MILLING  
MACHINES IN USE!**



The Bridgeport Turret Milling Machine has won universal acceptance. It has proved a most valuable time and labor saver in the TOOLROOMS and in production departments of the largest plants. Its wide range and versatility in MILLING, DRILLING, BORING and SHAPING enable it to serve as the complete central machine around which all operations revolve in many small shops.

It will pay you to explore the possibilities of the "Bridgeport" in your plant.

**WRITE FOR FOLDER**

**BRIDGEPORT MACHINES, INC.**

52 REMER STREET

BRIDGEPORT, CONN.



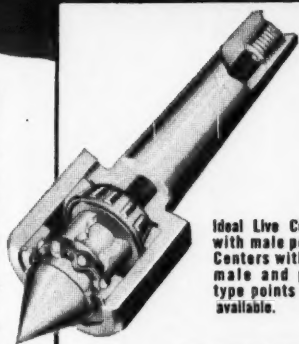
# They Cut Job Time in Half...

*with* **IDEAL Live Centers**

Mr. Paul Schmidt, foreman winding department, Milwaukee branch of the John Oster Manufacturing Co., Racine, Wis. says: "By using Live Centers when turning the commutators on our Wound Armatures we have reduced the (handling) time by approximately 50% . . . obtain a heavier cut . . . reduce heating by friction."



This case history is typical of what's being reported all over the country. On light and heavy turning jobs, wherever they are used, Ideal Live Centers are raising both quantity and quality of lathe work, cutting production costs. Because they turn with the work, even on the lightest turning jobs, Ideal Live Centers eliminate all friction between work and center. There's no grabbing or gouging, no time loss for lubrication or grinding. Work is more accurate, spoilage is reduced. Deeper cuts and higher turning speeds are safely achieved. Ask for information and a free demonstration on your own work. IDEAL INDUSTRIES, Inc., Sycamore, Ill.



Ideal Live Center with male point. Centers with female and pipe type points also available.

Also Heavy Duty Live Center — built to carry heavy loads. Accurate to .0005.



*Distributed Through*

**AMERICA'S LEADING WHOLESALERS**

Canadian Distributor: Irving Smith, Ltd., Montreal

# Mark It for Market



Modern Marking Machines now enable most manufacturers of metal components to identify their products at trifling cost.

**TRADE MARKS—  
MANUFACTURERS—  
PART NUMBERS—  
PERMANENTLY ROLLED  
ON YOUR PRODUCTS  
WILL HELP YOU MARKET  
THEM.**

Send prints of parts, showing required marking and its location on part with hourly production for free recommendation.

*Illustrated at the left is  
Model 135 Production  
Marking Machine.*

**WRITE FOR CATALOG**



## **GEO. T. SCHMIDT, INC.**

**1806 W. BELLE PLAINE AVE.  
CHICAGO • 13 • ILLINOIS**

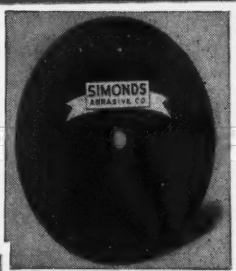
## the grinding job

Cutting-off 1 1/4" Hex Hollow Drill Steel to various lengths on a high speed abrasive cut-off machine. This is a continuous production job where fast cutting action and long wheel life are essential.



## the wheel

Borolon resinoid A30-S7-B1, 14" x 1/8" x 1/8", adopted as standard for this job because of its exceptionally efficient performance. Withstands the severe stress and strain of high speed operation. Ideal for cutting steel and alloy steel bars, rods, angles, tubing, etc.



**Borolon**

**Electrolon**

ALUMINUM OXIDE

SILICON CARBIDE

**SIMONDS**  
ABRASIVE CO.

PHILADELPHIA, PA.

## Grinding Wheels

Complete line includes  
every shape and size.  
Abrasive Grains  
Mounted Wheels and Points  
Surfacing Segments  
Bricks and Sticks

Available Everywhere



**SIMONDS**  
ABRASIVE CO.

GRINDING WHEELS

## where to get it

From your Simonds Abrasive Company distributor. He stocks Simonds Abrasive Company Grinding Wheels for every job and can advise you on wheel selection. Let us send you the name of the distributor in your area. Write now.

**SIMONDS**  
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Five City Furnace Plant Simonds Canada Resistor Co. Ltd. Rexdale, P. O.

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For the utmost wheel efficiency on every grinding job from roughing to finishing you can count on Simonds Abrasive Company Grinding Wheels — products backed by their manufacturer's experience as a leading producer of grinding wheels and abrasives exclusively, for over 50 years — products quality controlled from the crude abrasive produced by Simonds Canada Abrasive Company, Ltd., to the finished wheels available through our distributors. For consistently high quality results use Simonds Abrasive Company Grinding Wheels.

SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES

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OF YOUR INDUSTRIAL  
SUPPLY DISTRIBUTOR

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ST. LOUIS Jefferson 4805

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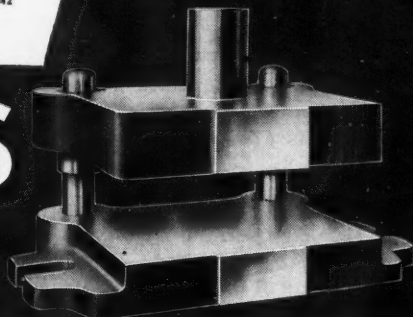
TORONTO Hudson 9071

YORK, PA. 2042

WHAT "NEAR NEIGHBOR" SERVICE  
MEANS FOR USERS OF

**PRODUCTO**

**DIE-SETS**



When you order Die Sets you expect fine workmanship, high accuracy and dependable performance, of course . . . but in most cases fast service is equally imperative. And that, with Producto, is guaranteed. We offer you the convenience of hurry-up service from supply depots right in your Near Neighborhood. Check the Producto list in the arrow above . . . you'll find a supply source that points to you . . . for telephone, telegram, or in some instances, teletype ordering.

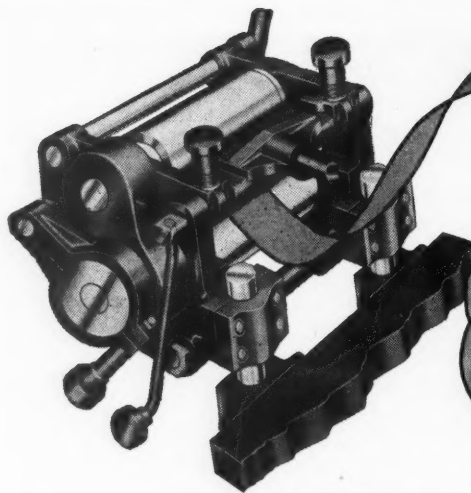
As to quality . . . the answer is evident in the nation-wide roster of Producto users . . . a veritable list of "who's who" in metal working plants.

Get in touch with "Near Neighbor" service, any hour, any day, for Standard (or Special) Die Sets of proven Producto performance.

**THE PRODUCTO MACHINE COMPANY** 760 HOUSATONIC AVE. TEL. 4-9481  
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*Phone for "Near Neighbor" Service*



**INSTALL**

**WHYTE**

**ROLL FEEDS**

**ON YOUR PUNCH PRESSES**

**FOR UNINTERRUPTED**

**PERFORMANCE**

**Made in all sizes — in all capacities  
Immediate deliveries on most models**

**WHYTE**  
**ENGINEERING CO.**  
33 LYMAN STREET  
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**Also Manufacturers of**  
Die Feeds • Dial Feeds  
Slide Feeds • Pick-Off Attachments  
Stock Straighteners  
Lamination Dies





## You get **FAST STOCK REMOVAL** by **HONING** **ON FULMER HONING MACHINES!**

The microphotograph above shows actual chip formation produced by honing on a Fulmer Honing Machine—the *fastest, most effective method* of finishing cylindrical bores. With Fulmer Machines, the abrasive stones *cut* the material off, rather than rub it away.

Fulmer Honing Machines handle bores from  $\frac{1}{2}$ " to 30" diam. Stock is removed *fast* with a high degree of accuracy. Tolerance on size, straightness, roundness can be held to  $\pm .0001$ ". Any surface finish ranging from 1 to 20 micro-inches RMS can be automatically produced.

Check these typical  
production examples  
of fast  
stock removal  
by Fulmer  
Honing Machines

PIECE	LENGTH	DIAMETER	STOCK REMOVED	TIME
Hardened Pump Liner	27"	7.250" $\pm .0005$ "	.015" — .018"	10 min.
Forged Gear Blank	Two 6" Bores	4.250" $\pm .0002$ "	.005"	1 min.
Chrome Plated Diesel Liner	32"	8.500" $\pm .0005$ "	.004" — .006" of chrome	3 min.

Get more facts on how Fulmer Honing Machines save production time, cut costs, and improve quality on finishing cylindrical bores. Write for illustrated folder giving machine specifications.

### C. ALLEN FULMER COMPANY

1233 First National Bank Bldg., Cincinnati, Ohio

# FULMER

## PRECISION PRODUCTION EQUIPMENT

★ Honing Machines • Rod Borers • Piston Ring Lappers

**PRODUCTION MEN:  
CUT PIERCING TIME AS  
MUCH AS 2000% ! .. WITH A  
WIEDEMANN TURRET PUNCH PRESS**

NO RUNNING  
TO TOOL ROOM  
OR DIE RACK

NO WAITING  
FOR DIE SET UP  
MAN

NO LAYOUTS

NO LOST  
TIME IN  
POSITIONING  
MATERIAL

NO SHUT DOWN  
OF PRESSES

NO WAITING  
FOR PRODUCTION  
TOOL UP

1. Short Run Piercing operations are handled at practically long-run high speed because layout and material handling are a matter of seconds.

2. No tooling up! All punches and dies are at your fingertips at all times—no need to wait for multiple dies on long-run jobs. Start immediately when you have a Wiedemann while production dies are being made.

3. Special template piercing type makes templates that are accurate to  $\pm .002$ " and a companion machine pierces through templates with no danger of damage to the template.

4. The same high accuracy in all machines from hand operated to 80 ton motor driven types.

**WIEDEMANN MACHINE COMPANY**

4219 Wissahickon Ave.  
Philadelphia 32, Pa.



NO SHEARED PUNCHES  
AND DIES FROM INACCURATE  
SET UPS

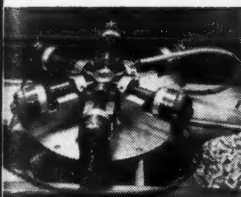
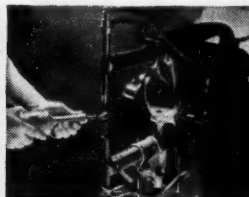
GET THE FULL STORY  
OF SHORT RUN  
PIERCING SPEED  
AND ECONOMY.  
WRITE FOR THE  
NEW WIEDEMANN  
BULLETIN 92



**Dumore No. 9 Handgrinder**  
 $\frac{1}{4}$  HP; 15,500 rpm.;  $\frac{1}{4}$ " chuck capacity



**Dumore No. 10 Handgrinder**  
 $\frac{1}{10}$  HP; 22,000 rpm.;  $\frac{1}{8}$ " chuck capacity.



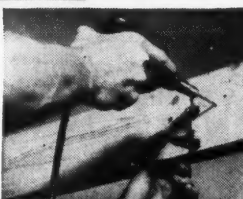
**Dumore No. 8 Handgrinder**



$\frac{1}{20}$  HP; 18,000 rpm.;  $\frac{1}{8}$ " chuck capacity.



**Dumore Duplex Handgrinder**  
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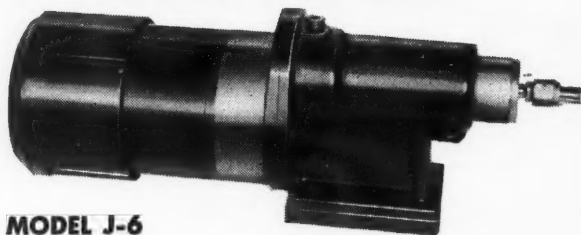
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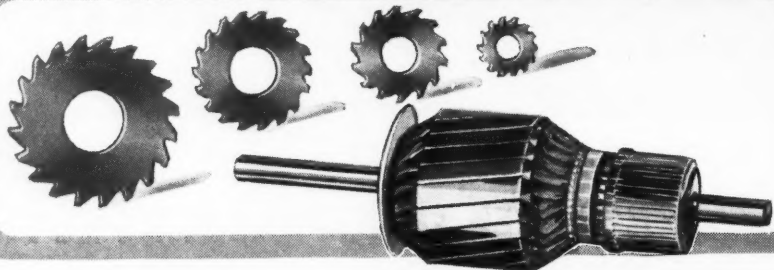
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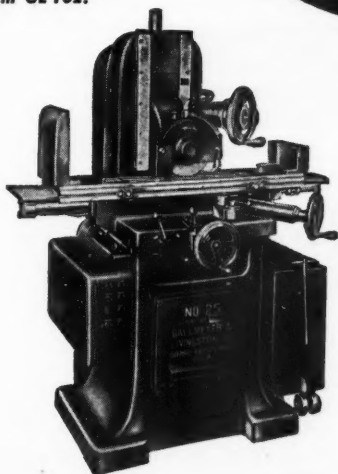
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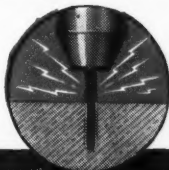
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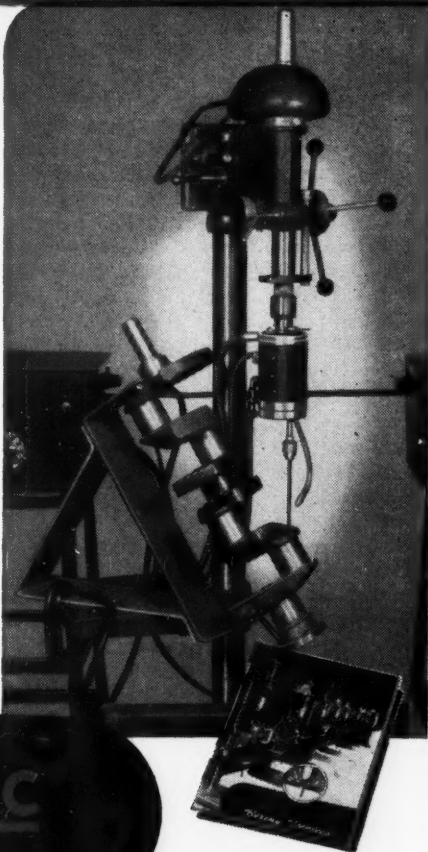
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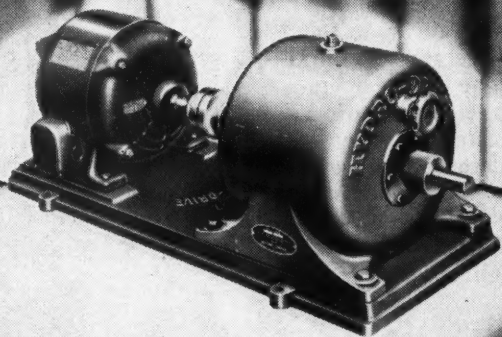
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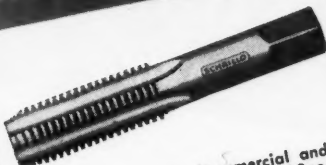


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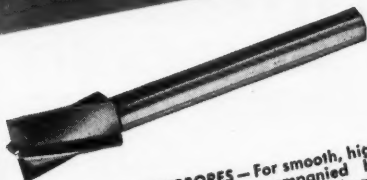
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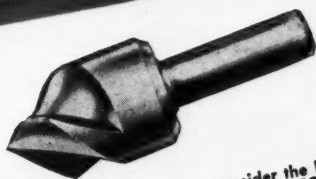
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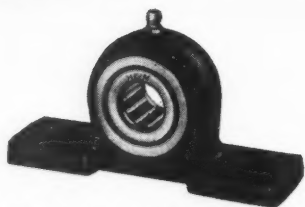
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*Aero Tool Engineering Company*

# DUST FREE ROLLERS IN A NEW FLANGED TYPE SELF-CONTAINED ROLLER BEARING

## HEIM

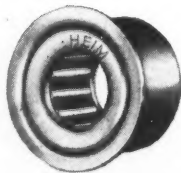
### FLANGED TYPE SELF-CONTAINED ROLLER BEARING



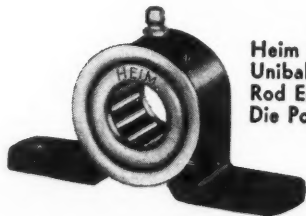
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Block—Cast Iron Body



Roller Bearing Flanged  
Pillow Block



Flanged Roller Bearing



Roller Bearing Pillow  
Block

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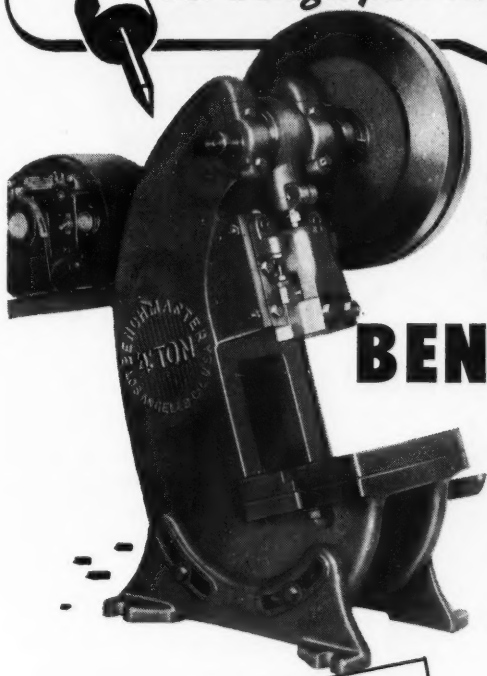
Heim also makes:  
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**156,000,000 FURRING NAILS** with-  
out a single part failure or replacement*



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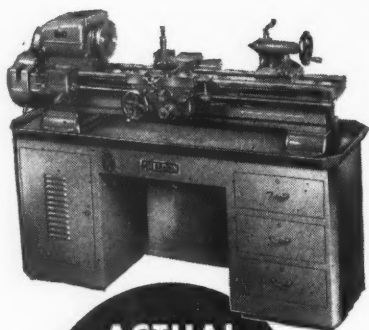
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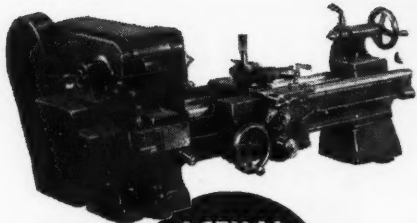


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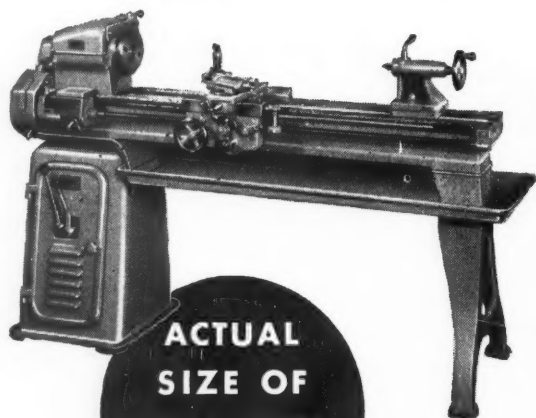


**SHELDON  
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**Add A SHELDON**

**for Profit**



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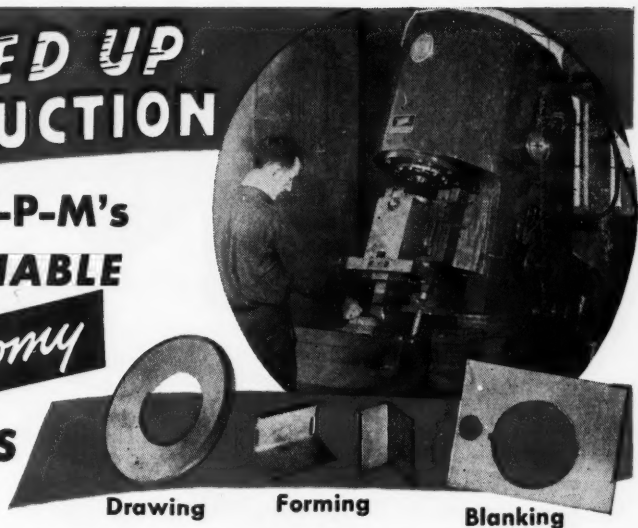
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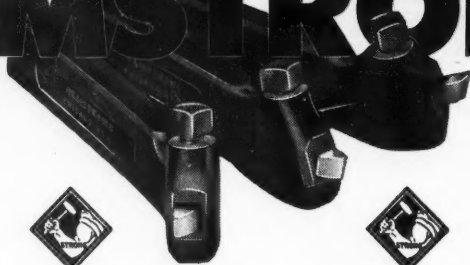


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# MODERN Machine Shop

JUNE, 1948

VOL. 21, No. 1

CINCINNATI, OHIO

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## *This Month*

"Quality of product is essential to continuing success"—the radio slogan of a well-known manufacturer—might well be considered the theme of this month's feature article. Written by Mr. L. Kasper and starting on page 124, the article explains the fundamental concepts of quality control as a means for obtaining specified quality standards. Mr. Kasper points out that quality control is a combination of actions or procedures which are designed to improve the quality of a product as indicated by inspection records.

In Mr. Hinman's fifth article on "Progressive Die Design," which you will find on page 144, the construction and operation of two dies—one for forming fuse escape levers and the other for producing double-edge razor blades—are illustrated and described. Die designers will find this article instructive and practical.

Many promoters of best selling books today tempt the prospective buyer of their books by the statement "You won't be the same person after reading this book." We won't attempt to incite your interest with such an exaggerated claim but we do feel that after you have read Dr. Hutchison's article on "Human Freedom," which appears on page 154, your thoughts regarding domestic as well as world issues will never be the same.

It is rare that we devote as much space to a review of a training film as we have with "Strange Interview," by Lyne S. Metcalfe, which appears on page 168. In this review, you will find a number of very helpful suggestions which are basic in the maintenance of harmonious working conditions in any manufacturing plant.

The "Ideas from Readers" section, beginning on page 192, contains a number of the usual helpful suggestions. The practical applications of modern equipment section which begins on page 178 contains four items of unusual interest.

New tools and equipment are illustrated and described in the "New Shop Equipment" section. Page 226.

The handy reference section "Where to Get It" appears on pages 352, 353, and 354.

# Quality Control--

## The Preventive Medicine of Industry

By L. KASPER

**T**HE man who periodically visits his physician for a physical checkup may expect a longer and more pleasant life than the man who consults his physician only from a horizontal position on a hospital bed. The city which maintains health organizations for the prevention of epidemics will be a safer place in which to live than the cross roads settlement where the drinking water is pumped from a well at the back of the stable. By the same

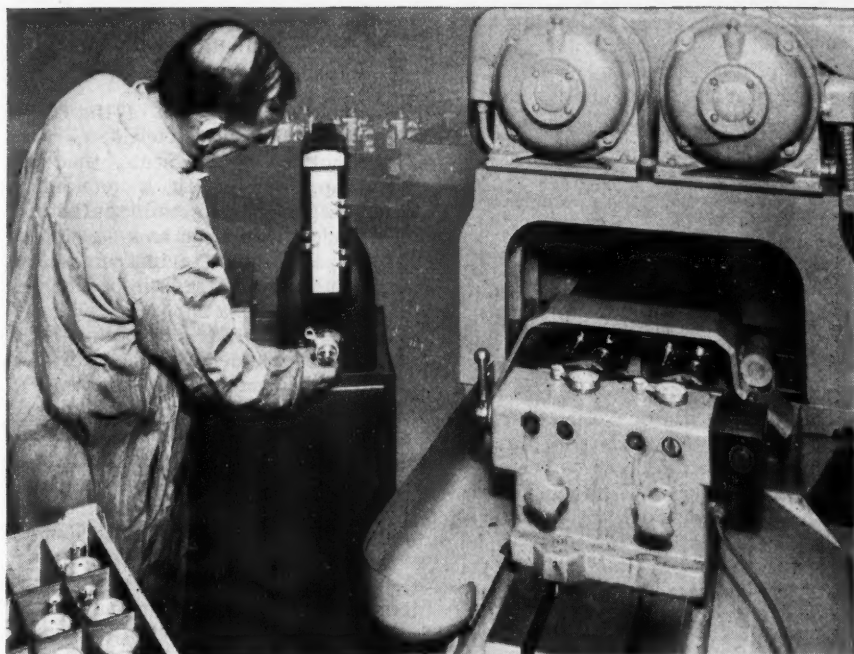
token, the manufacturing enterprise which makes use of quality control as a preventive measure may expect a longer and more prosperous existence than one in which the products are produced on a hit-and-miss basis.

Although the term "quality control" is a simple term which really requires no interpretation, the introduction of quality control methods has met with opposition on the part of some factory executives, who consider

it only as a system which demands a tightening of tolerances to a point impossible of practical accomplishment. Again, the term may conjure up a vision of hundreds of heartless inspectors, working feverishly to uncover slight defects in the product which may gain for them the pleasure of throwing the product into the scrap heap. Still another picture shows piles of statistical reports, graphs and



Checking the Outside Diameter of Parts at Grinder with Sheffield Gage.



Internal Diameter of Refrigerator Mechanism Connecting Rod is Checked With a Sheffield Precisionaire. The Photo was Taken in the Plant of the York Corporation, York, Pennsylvania.

charts, made up for the express purpose of providing occupation for a group of high-browed statisticians whose sole aim in life is to expose every worker, from top to bottom, as an abject failure in his chosen occupation. Quality control may or may not cause a tightening of tolerances, it will require some inspection of parts and products, and it does require compiling some records, but in many instances each of these operations results in the reduction of other and similar operations.

Quality control is not merely inspection, nor is inspection alone any form of quality control. Inspection exposes deviations from specified quality standards, but it cannot prevent them; the most intensive inspection program cannot build quality into a product.

But by the act of exposition, inspection indicates the need for preventive action. If preventive action is not followed, the need for inspection becomes continually greater, but it can never reach a point where it will eliminate the need for some controlling action. Quality control is actually a combination of actions, or procedures which are intended to improve the quality of a product as indicated by inspection records.

Efficient quality control is that system which controls quality with the least amount of waste, with the least amount of "red tape," and without affecting adversely the cost of the product. Obviously, there can be no empirical rules of quality control which are applicable to all enterprises; the shoe factory requires a different method of

control than the locomotive factory. Just what procedure to follow must be determined by the management as indicated by the demands of each particular industry. However, quality control may be applied to any form of endeavor, as, regardless of the application, the objective is the same in all cases, and principles are the same; it is the method of application which must vary to suit each condition.

The manager of a small plant may be of the opinion that the expense of maintaining a quality control organization would be prohibitive, or that the cost of the product would be increased thereby. Quality control may result in the attainment of either one or all of three objectives; namely, (1) an improved product without an increase of cost, (2) a reduction in the cost of the product without a lowering of the quality, and (3) an increase in the market demand for the product due to the attainment of one or both of the other two objectives. If quality control results in the attainment of any one of the foregoing objectives, it will at least balance the scale, even if no increase in profits over a period of time were apparent. If quality control fails to attain the objective, the failure will undoubtedly be due to incorrect application.

If the fact that many large, progressive manufacturing concerns maintain quality control programs on an elaborate scale far beyond the reach of the smaller plants, may be taken as a basis for judging the value of such a program, the question then arises, "Would a quality control program, on a smaller scale, benefit the smaller plant proportionately?" To state unequivocally that the smaller plant would duplicate the benefits experienced by the larger plant would be to deny the existence of any limitations which must be recognized. That any plant, regardless of size, will benefit by the installation of an efficient quality control system is a proven

fact, but the size of the smaller plant and the facilities available limit the extent to which quality control may be satisfactorily instituted.

To illustrate the truth of the foregoing statement, let us consider a case at the bottom of the scale, the one man shop. John Smith, a machinist, decided to enter business manufacturing a gadget which he had developed in his spare time. Having an empty garage in his back yard, he purchased a lathe and set up a shop. Being a conscientious worker, and realizing that his success would depend entirely on his ability to satisfy his customers, Smith carefully manufactured his gadgets, checking dimensions, finishes and operating efficiency of each gadget before shipping. At this stage Smith is his own quality control organization, though he has not thought of it as such. Smith prospered, and in a short time he had a backlog of orders which he found impossible to meet through his own efforts. Therefore, he purchased another lathe and hired Bill Jones to operate it. Though Jones would ordinarily be considered a conscientious worker, Smith soon discovered that he had "off" days when he would produce parts which had to be scrapped. As each part scrapped represented a loss to Smith, Smith decided that he himself would need to check the quality of the parts produced by Jones. Theoretically, when Smith hired Jones, the output of the shop should have doubled; actually it did not, due to the time consumed by Smith in checking the work of Jones. Thus, at this point, an expansion of 100 per cent in personnel and equipment did not result in an equal increase in output, due to the activities of the elementary quality control organization.

Although Smith had reduced the output of his own lathe in order to maintain a quality which he had set as a standard, increasing orders

Sheffield Precisionaire is Used by the  
Operator to Check Pin Holes in York  
Refrigerator Pistons.

proved that his quality control program was at least helpful in satisfying his customers. Orders continued to pour in, and before long, Tom Brown was hired to operate a third lathe. The output of Smith's lathe was reduced still further by the hiring of Brown, as Smith was now required to inspect the work of both Jones and Brown. However, Smith discovered that the time he consumed in inspection was considerably less than when he had first hired Jones. The reason was that Smith had unconsciously been applying quality control procedures in his inspection routine; he had kept a record of the number of pieces which had been spoiled by Jones, and the reasons therefor. The records showed that spoiling of all of the pieces had not been due to carelessness on the part of Jones, but could be traced to a point in the technique of manufacture. When this point was corrected, the number of rejected parts attributed to Jones decreased immediately. When Brown was hired, the experience which Smith had acquired from the inspection records of Jones, prevented the same errors from occurring to Brown, and in the elimination of errors new techniques had been developed, which, in addition to reducing the number of rejects, had also resulted in reducing the time per piece.

In the above story, had Smith been content merely to inspect the work of Jones and discard the defective parts, he would have been controlling the



quality of the parts shipped to the customer, but this would have been done at the cost of reduced profits. This procedure would not have been quality control; it would have been merely inspection and rejection. But when Smith took steps to reduce the number of rejects, he began to apply the principles of quality control. Up to this point, the benefits derived by quality control procedures would be directly proportionate to the size of the plant, as machining techniques only were involved. But, if now Smith were to receive complaints from his customers that his gadgets were wearing out prematurely, or that breakage was excessive, or for some reason which could not be traced to incorrect design or machining practices, the large plant would have an



advantage over Smith, due to the availability of equipment which is necessary to determine the reasons for such failures, but which would be financially out of reach for the small plant. The only recourse for the small plant would be to have such testing performed for it, which would add to the cost of the product to a greater extent than if the facilities were available in the small plant.

It is understood that only products which will satisfy the customers' quality standards should be shipped, otherwise the penalty of rejection will be enforced. However, if these quality standards are met by the simple but expensive expedient of separating the bad units from the good without any effort at controlling the number of bad units produced, it will be necessary for the manufacturer to receive an excessively high price for his product if he expects to remain in business. Although competition on either a quality or cost basis may not be as keen today as it was in pre-war days, there will be a definite return to those conditions. Sales records are produced by the number of units accepted by the customer, but manufacturing costs are governed by the number of units or parts thereof which have been produced, including rejects. The number of rejects turned back at the shipping or final inspection point is an indication of the results of whatever quality control methods which may be followed in the factory. Inspection at this or any other point can in no manner change the quality of the product; this can be done only by the control of quality during the processing operations.

Quality control does not guarantee that the product will always be of the highest quality, nor is this desirable. Good engineering practice dictates working in the opposite direction by specifying the greatest latitude consistent with the intended perform-

ance. It must not be construed that a carelessly constructed product will give the best performance, but the possibility of excessive accuracy may greatly increase the cost of the product without adding to the performance quality or useful life of the product. Even good engineers sometimes specify closer tolerances than necessary as a matter of self-protection. This is particularly true in the design of a new product where the engineer may be criticized for the failure of a part but would not be held responsible for high manufacturing costs. Quality control, by indicating the impracticability of excessively close tolerances, frequently results in reducing manufacturing costs by leading to action which reduces the quality to a point which results in the production of a satisfactory product which can be marketed on a competitive basis.

It has been previously stated that inspection is not quality control. But quality control must be built on the foundation which inspection prepares; without inspection, quality control would be impossible. For effective quality control, inspection must begin at the beginning,—the raw material, or material received. The methods of inspection must vary with the type of material used and the product which is to be produced. However, there are certain fundamental principles which apply under all conditions.

Material received falls into two general classes; namely, raw materials such as castings, bar stock, sheets, lumber, cloth, and so on, and accessories, such as screws, motors, switches, and similar parts, each of which must be subjected to certain tests to prove their dimensional accuracy or operating effectiveness.

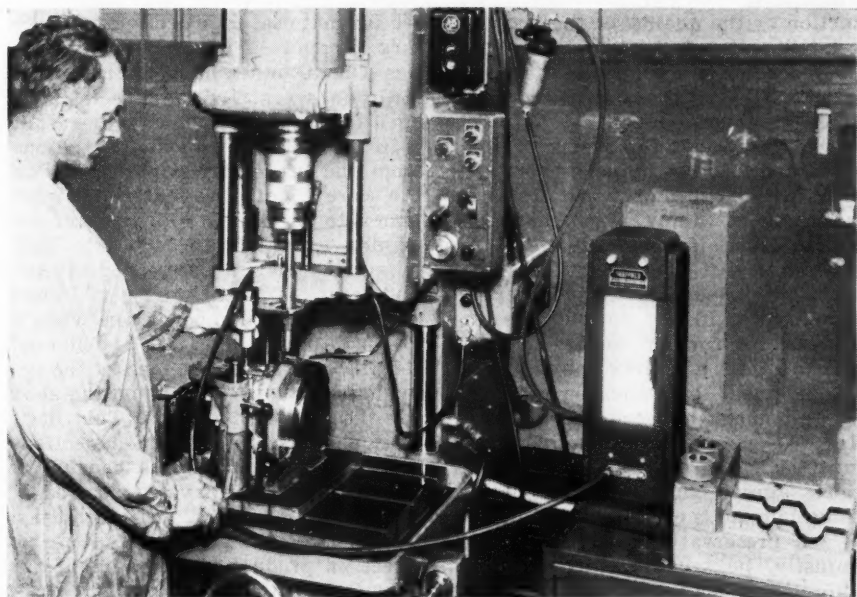
The inspection of raw materials may be thorough or perfunctory depending upon the application which it will be required to fulfill. Bar stock or sheets which are to be used for panel-



ing or housing a part of a machine may be satisfactorily inspected by dimension spot checking. This same material might be used where surface defects might result in rejection of the finished product, or added labor in polishing. Again the same material may be required to withstand certain me-

depend on the supplier to apply the necessary tests.

Theoretically, any inspector is required to check materials only for the specifications indicated on the order, insofar as it is possible for him to do so with the available equipment. What the material is to be used for is



The Operator of the Honing Machine Shown Here is Using a Sheffield Precisionaire to Check Work at the Machine. The Photo was Taken in the Plant of the York Corporation, York, Pennsylvania.

chanical manipulation, such as cold forming or drawing. In each of the cases mentioned, some form of dimensional checking will be required. In the second case, surface inspection will also be required. In the third case, some form of physical test must be applied. Dimensional and surface conditions do not require the use of any equipment other than that which is available in every plant. Physical testing equipment, however, is usually not available in the smaller plants, who

not his concern. However, any knowledge which the inspector may possess as to the use of the material may prove of great value in cases where slightly off-specification material may be received. If the inspector is vested with the authority to accept such material which may be usable without adding to the cost of fabrication, delays in production may frequently be avoided. The rejection of any material represents, as a minimum added expense, the cost of handling time which

may vary from a few minutes trucking time to the handling and repacking of a large amount of material. If the need for the material is critical at the time it is received, and cannot be replaced without serious delay and loss of production, it would represent a poor example of quality control to reject the material for a slight defect which would not seriously affect production or the quality of the product.

Intelligent judgment on the part of the inspector can be acquired only by experience with the operations to be applied on the material, but any knowledge which the inspector may acquire should not influence his judgment without authorization from the management. Many plant managers oppose such authorization on the ground that if once deviations from specifications are permitted there is a normal tendency to increase the latitude for further deviations. It is difficult to set a definite line as a basis for judgment, but when once formed by agreement between the inspector and the management, both parties must endeavor to observe the conditions agreed upon. The inspector, being human, is endowed with a sense of self preservation, and if criticised unjustly, he will thereafter protect himself by accepting only material which meets specifications to the letter. Both the slipshod inspector and the super-critical inspector may prove costly extravagances. To obtain effective inspection of incoming material without approaching either extreme requires careful instruction of the inspector by the management, and a definitely stated responsibility and authority which may, of necessity, be modified as conditions dictate.

If the term "quality control" is interpreted in the strictest sense, only perfect material will be accepted. As this is impossible at all times in actual practice, the question arises as to the best method of handling off-specifica-

tion material. Theoretically, the material should be tagged defective, indicating the nature of the defect, thus warning the operators to temper the processing accordingly. But some workers are psychologically so constructed that the presence of a defect tag on a lot of material results in dissatisfaction, the feeling being that the management expects them to use defective material to produce a satisfactory product in satisfactory quantities. On the other hand, if the operator is not warned of the defects, damaged tools and equipment may result.

In order to overcome objections from the processing departments on the score of defective material, a good plan is to tag all material received, assigning a number to each lot. Each lot is recorded in the stock department and any pertinent data is noted against the lot number. Then, when a lot of defective material is delivered for processing, the foreman of the department is warned to be on the alert for the indicated defects. This may, in some cases, result in objections from the foreman himself because of the effect it might have on his production record. However, if the condition is so severe as to produce a noticeable effect on production, some slight adjustment on the piece rate will probably prove less costly than the delay which might result from rejecting the material.

On material which is received as an assembly, the inspection problem will be more complex. The part may be one which may vitally affect the operation of the completed assembly, or it may occupy a position of secondary importance. A part may be dimensionally acceptable and be functionally useless; it may be a part which, if imperfect, may create an undesirable condition, such as noisy operation, without detracting from its functioning efficiency. A part may be quite inexpensive, but may be so located in the assembly

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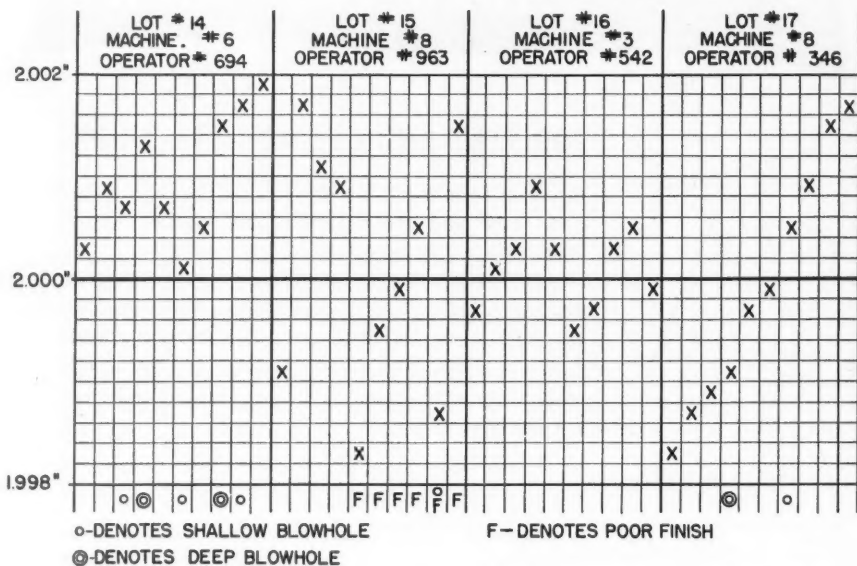
the *Sheffield* corporation  
Dayton 1, Ohio, U. S. A.



that replacement is difficult and costly. These are the factors which must be considered when a decision is to be made on the adoption of an inspection routine.

If a part is specified to certain performance standards, there is but one

tance, following inspection of materials received is tool and gage inspection. Though a tool may not produce parts which dimensionally should be produced as indicated by the setting of the tool, due to some feature of its application, a careful check of the tool



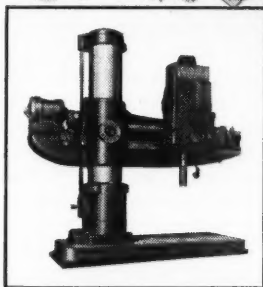
Typical Quality Control Chart Showing Results of Inspection on Cast Iron Cylinder Sleeves for Diameter, Finish, and the Condition of the Casting With Reference to Blowholes.

method of determining whether or not it meets the specifications and that is to apply an actual performance test. This may be a costly procedure requiring a considerable amount of time. The only alternative is to purchase from a manufacturer who is known to subject his products to rigid tests before shipment. Occasionally defective parts will pass through in spite of all precautions, but if records are kept of each shipment received, the supplier may be notified if the number of rejects exceeds a pre-determined limit.

Next in sequence, if not in impor-

eliminates one possible source of error. A tool may be capable of producing acceptable parts even though the tool itself is not in perfect condition, but the possibilities of failure are greatly lessened by any corrections which can be performed before starting the operation. Imperfect parts may still be produced but the cause may more readily be traced if the tool is known to be in perfect condition.

Inspection of tools during runs, whenever possible, will likewise serve to reduce the number of rejects. It would be folly to dismantle a set-up during a run to inspect the tools min-



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utely, but many times a visual inspection of the tool and the set-up will indicate the possibility of an impending failure. Theoretically, the condition of the parts produced should indicate the condition of the tools, and vice versa, but if one piece of spoilage can be avoided there is the same possibility that many more will be prevented.

First piece inspection is frequently employed as a check on tool and set-up accuracy, approval being required before starting production. This is definitely a good practice provided that too much dependence is not placed upon it. It may happen that the first piece will be perfect but the set-up of the machine will not permit duplication. Failure to properly clamp or lock a fixture may result in a gradual but continuous change in the position of the part, which may have been detected had the set-up been checked before the first piece was produced.

When production has started, there must be a continuous process of inspection if defective parts are to be held to a minimum. What is generally known as floor inspection is the process of checking parts as they are produced. Although each operator may have a working gage at his machine or work place, this is generally not considered sufficient to guarantee the production of acceptable parts. Therefore, a check on the producer's check is performed by a floor inspector. As the title indicates, a floor inspector operates on the floor where the processing is being performed, but it does not necessarily indicate that he circulates among the machines. The system which is followed must be governed by the nature of the parts being produced, the best method being that one which will result in the closest follow-up without being too cumbersome. In many cases, the most effective method is to have the inspector centrally located, the parts being brought to him in pre-determined quantities.

One advantage of this method is that if a variety of products are passed through the one inspector's hands, the inspection tools and gages will always be within reach. Obviously, if the parts are large or difficult to transport, a circulating inspector will not only be the least expensive, but will be in a position to better check the production of each machine, especially if the time cycle of circulation can be held to short intervals.

There is one disadvantage in circulating inspection in that all parts for which he is held responsible will receive inspection on a time cycle rather than on a quantity cycle basis. This may not prove too serious if the time per piece does not vary too greatly on the various operations, but it may happen that the most rapidly produced parts require more frequent inspection, in point of time, than other more slowly produced parts. However, if the volume is sufficiently great to maintain more than one inspector, the inspection responsibilities may be allotted so that the timing cycle of each will coincide closely with the quantity output of a group of operations. There are many factors which favor circulating inspection. The inspector may detect any incorrect usage of gages by the operator, or he may notice a condition in the set-up of a machine which might later result in spoiled work if not corrected. Obviously the closer the control exercised by floor inspection, the fewer will be the number of rejections in the final inspection. However, this poses the question of limitations; 100 per cent inspection is the only method of guaranteeing perfection, but is too costly for many products.

It would be ambiguous to state that inspection alone, without any records of the results of inspection, is valueless, but it can safely be stated that records will add to the value of any inspection program. A study of the



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records, if carefully compiled, will indicate not only the number of rejects but also the reasons therefor. Any trend toward the dimensional border lines will be indicated as gradual, sudden or spasmodic. The consistency of both operators and machines will be indicated, as will variations of certain of the materials.

Before satisfactory records, which will indicate certain trends, can be compiled, it is necessary that equipment be available to indicate variations within the limits imposed. For example, go and no go plug gages are effective only in separating the good pieces from the bad, and cannot indicate any in-between dimensions. In compiling quality control records, it is necessary to indicate actual dimensions within the tolerance range, otherwise any trends toward the border lines cannot be detected. If the number of rejects in any lot becomes too great, corrective action will reduce the number, but one of the most important features of statistical control is to eliminate, as far as possible, any rejects by instituting corrective action when the records indicate any trend toward a condition which will necessitate rejection.

The most elementary form of statistical control is one which merely records the number of rejects; a record of this type is of value only in indicating the need for corrective action, and in indicating the effect of such action. The waste of both labor and material may be reduced somewhat by such a record, but it falls far short of a satisfactory procedure because it does not warn that losses may occur; it states bluntly that a loss has occurred, and it is too late to do anything about it. The next step in increasing the value of a record is to indicate the reasons for the rejections; this will be of value even though the reason stated may not be very specific. A record may indicate that most re-

jects are occasioned by oversized holes and very few by undersized holes. This in itself would serve to indicate that the setting of the tool is probably too close to the upper limit; resetting the tool toward the lower limit would undoubtedly result in fewer rejects. As more details are added to the record, it becomes more valuable provided they do not result in misinterpretation.

An analysis of a typical chart will serve to indicate now a simple chart may indicate a number of conditions. The chart herewith shows the result of inspection on a cast iron cylinder sleeve, for diameter, finish and the condition of the casting with reference to blowholes.

Referring to the chart, Lot 14 indicates that all dimensions, although within tolerance, are above the nominal size. This indicates the advisability of some adjustment which would tend to place the dimensions closer to the center of the tolerance, therefore reducing the danger of exceeding the tolerance in either direction. However, before any action is taken, it would be well to determine if a newly ground tool has been installed in the machine. If this proves to be the condition, it would probably be advisable to continue without any changes, as the normal wear of a boring tool tends to reduce the diameter produced, which is the desirable condition in this case.

Lot 15, also within tolerance, indicates a wide variation in dimensions. This condition may possibly be improved by some adjustment such as added support to the tool. However, a comparison of the record of the previous lot indicates the possibility of either or both of two reasons for the variation. It will be noted that the two lots were produced by different machines and by different operators, either of whom may be responsible, and both of which should be studied.

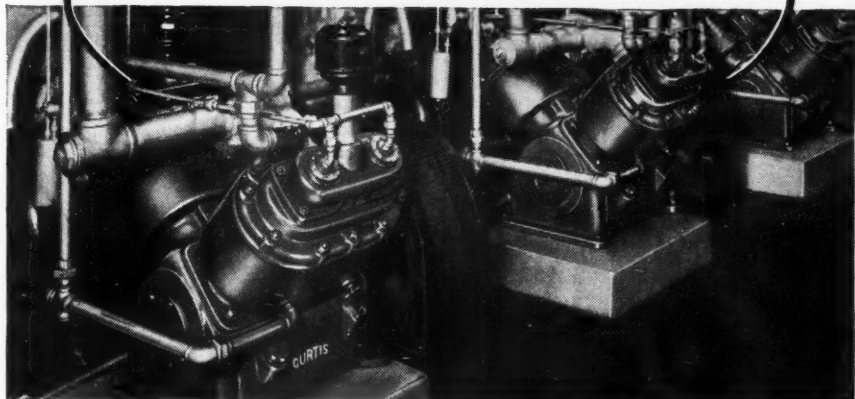
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Lot 16 indicates an ideal condition, the dimensional range over the lot consuming less than half of the tolerance, approximately equally distributed on both sides of the nominal dimension. If intelligent corrective action is performed on any operation, it will be found that the chart for each succeeding lot will gradually approach this condition.

Lot 17, which fluctuates in dimensions to the same degree as Lot 15, was produced on the same machine but by different operators. This would normally indicate that the cause lies in the tool, the machine or the setting, though this cannot be definitely determined without investigation. A comparison between Lots 15 and 17 shows a difference in the sequence or pattern of the dimensional changes, Lot 15 being sporadic whereas Lot 17 shows a trend toward the upper limit. If the parts are withdrawn from the lot at random, this condition will hold no special significance, but if the parts are inspected consecutively as produced, and therefore indicates a trend toward the higher side, which may be caused by a misadjustment of the tool, machine or set-up. This pattern sounds a definite warning, as a continuation of this trend into the next lot will inevitably result in oversized bores.

If the trend indicated in Lot 17 were in the reverse direction, toward the lower dimension, it may indicate excessive wear of the tool. With normal tool wear, the trend will be in the same direction but will be more gradual, and if carefully followed on the records, will serve to indicate the number of pieces which may normally be expected before the tool must be replaced or reconditioned. Replacing the tool before the allotted number of pieces have been machined, before any rejects have been produced, is logically the most economical method of manufacture.

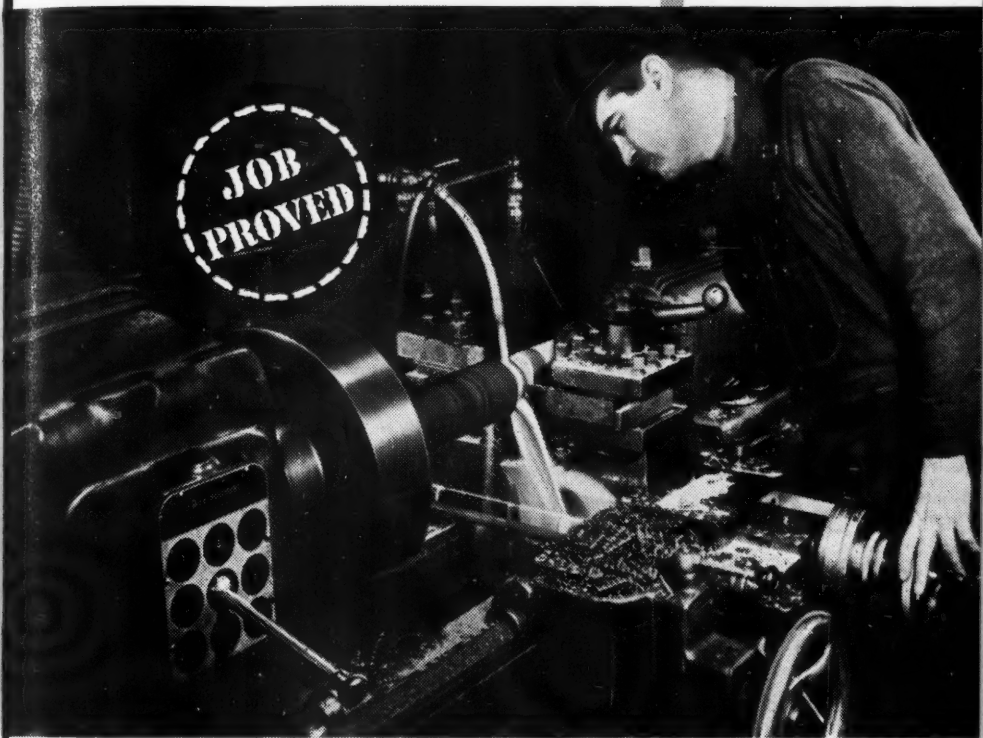
It will be noted that in Lot 15, six pieces were produced with poor finish. If the pieces in the lot were inspected as produced, this indicates that after the fourth piece was produced, either the cutting tool chipped suddenly or that a piece of metal became attached to the cutting edge. The need for immediate action is apparent.

It will be noted that the inspection for finish also included blowholes which may have been exposed by the machining operation. If all the castings were furnished by one supplier, the conditions of the castings and the number of imperfect castings in a given quantity, as shown by the chart, indicates the need for corrective action on the part of the supplier. If castings are furnished by more than one supplier, the name of the supplier of each individual lot should be recorded, which will serve as a guide in selecting the most desirable supplier, or may indicate the advisability of a change in material.

When a quality control program is instituted, the extent of the inspection and charting which is decided upon as a requirement should preferably be on the excessive or high side, until definite improvements are noted, and then narrowed down gradually. It requires a certain length of time for the working personnel to acquire quality consciousness, which in itself, tends toward a reduction in the intensity of the control factors.

One important factor which determines the possibility of close control is the nature of the parts being checked and the characteristics which require control. If these characteristics cannot be determined without destructive testing, it is impossible to enforce 100 per cent control, and sampling must be resorted to; a number of pieces taken from a lot must be assumed to indicate the condition of the entire lot. In compiling statistics for quality control on a sampling

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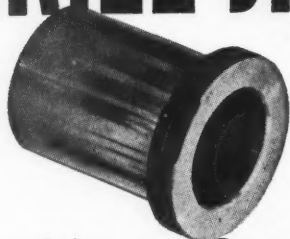


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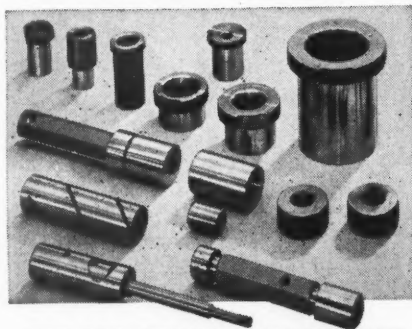
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basis, experience over a period of time is the only factor which may be used as a basis for determining the minimum sample size which will prove generally satisfactory. The sample size may be governed by the importance of the characteristics to be controlled, by the ease or difficulty of the test method, and the destructiveness of the test. Although sampling cannot guarantee the acceptance of any parts of the lot other than the samples, as it assumes that any changes toward non-acceptance will progress gradually, it is definitely better than no testing at all, and if carefully recorded and studied, cannot fail to reduce the number of consumer or final assembly rejections.

Timing of inspection and recording is of extra importance for close quality control. Allowing lots to accumulate and then clearing them off in one intensive drive defeats the purpose of the program, as defects cannot be detected in time to prevent considerable loss in case of deviation.

Much has been written about methods of quality control; much more will be written, as each product and method of manufacture presents its own particular problem. There can be no one perfect system which is a cure-all; it is necessary for each plant to work out its own solutions, it may be necessary to modify the procedures frequently in the beginning until the program is operating smoothly. But even an important system will indicate some improvements, which will increase in proportion as the necessary modifications are effected.

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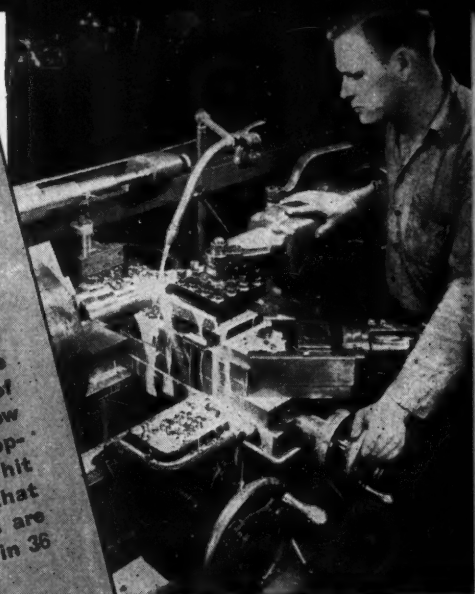
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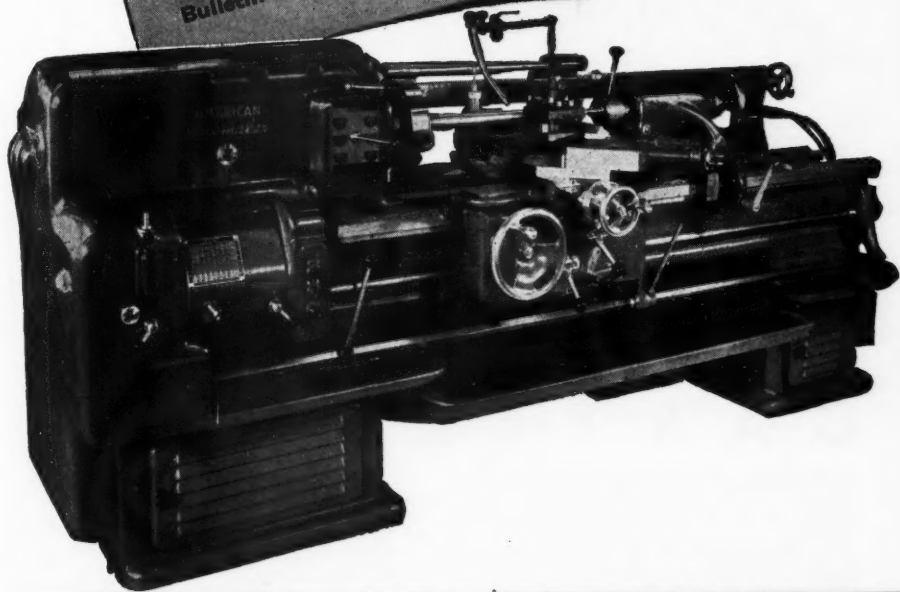
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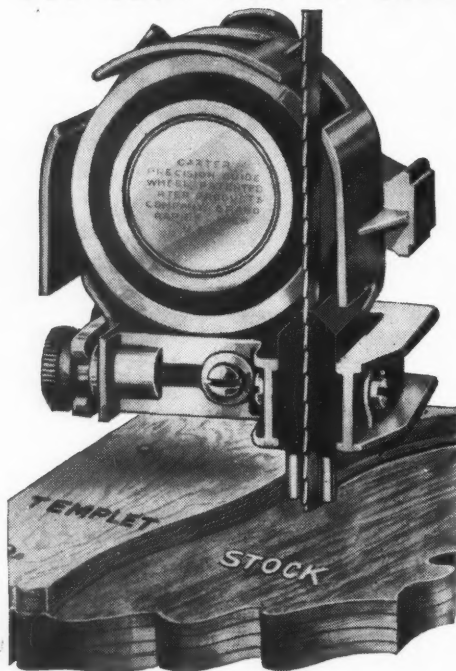


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# Progressive Die Design, Part V

**In this article the author describes the construction and operation of two dies — one for forming time fuse escape levers and the other for producing double-edge razor blades.**

By C. W. HINMAN  
Designing Engineer

**T**HE precision of the workpieces that may be produced in a progressive die depends largely upon the precision with which the die itself is constructed. An excellent example of a precision made die which is used for the production of precision parts is shown in the accompanying illustration Fig. 13. The workpieces that are produced by means of this die are time fuse escape levers on which a tolerance limit of plus or minus 0.0002 inch is maintained on practically all dimensions including the contour. The work material from which the levers are made is 0.012 inch gauge crucible sheet tool steel.

## Designing the Die

In order to obtain the close tolerances on the workpieces, the die must be built in sections, and all of the interior surfaces of the die contours must be ground to exact sizes. The blank must be cut in a carefully constructed compound die, since the

two side lugs on the levers can be more easily formed "up" instead of "down." This procedure requires a compound die of the inverted type, or the "upside down" design, in which the pierced slugs from the center hole of the workpiece may be pushed up into the punch and punch-plate. A spout on the punch holder, which may be seen in the upper view of the illustration, provides an exit from which the slugs are delivered from the die. In order to form the center lugs, sufficient metal must be provided in the die wall to allow for trimming around the blank, after it has been blanked.

All of the rules pertaining to good die making were strictly observed in building this die. Holes through the stripper plate, and in the die blocks, were lapped after grinding, and then "bushed" to provide maximum resistance to wear. Piercing and shaving punches were lapped to within limits of plus 0.0001 or minus 0.0000 inch, and were fitted in their respective die holes to within 0.0001-inch clearances.

Fig. 13 — Illustration showing a fourteen station high precision progressive die which is equipped with wearproof phosphor bronze guide bushings and special steel bumper-pins.

(Photo Courtesy Moore Special Tool Co., Inc.)

### Progressive Operations of the Die

The blanking center distance between die stations worked out to 0.466 inch, which figure may be seen stamped on the die shoe. The die comprises fourteen consecutive stations, and beginning at the right-hand end of the die, as viewed in the lower portion of the illustration, the stations are as follows: (1) pierce two pilot holes; (2) "pilot"; (3) idle; (4) idle; (5) idle; (6) compound blank and pierce; (7) idle; (8) idle; (9) idle; (10) trim around one side of the blank; (11) idle; (12) trim around opposite side of the blank; (13) idle; (14) form up two center lugs, positive strip-off on punch, and eject finished work by compressed air.

A spout which may be attached to a compressed air hose may be seen at the left on the die shoe (lower view), near one of the bumper pins.

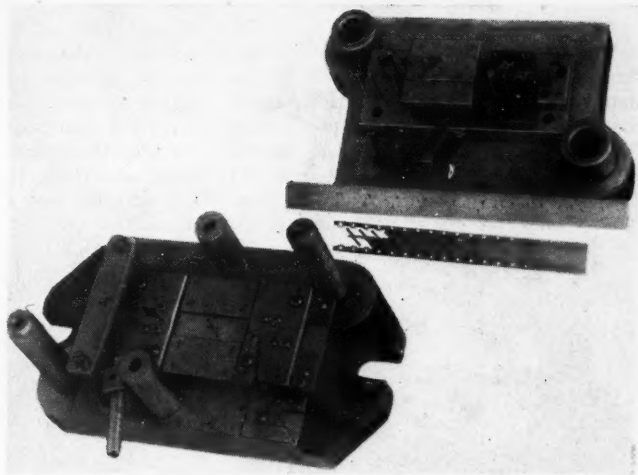
### Functions of the Idle Stations

Most of the stations in this particular die are idle stations at which no work is performed. It is necessary to provide the idle stations for the reason that this die is built in sections and the sections are "sunk" into the die shoe in order to hold them in place. This type of construction requires that a sufficient amount of metal be pro-

vided around all the die openings. Additionally, idle stations provide shedder space for the compound die station and also provide a sufficient amount of space for the flange on the shedder and for the stripper bolts and compression springs.

### Registration of the Work

In all progressive dies, and particularly in this one, it is necessary to continually relocate the work strip in the die in order to align it with the pilot punches which enter previously pierced holes in the margin of the strip. This procedure enables the work to be accurately registered at each of the work stations before the cutting punches descend far enough to contact the work strip. From the illustration of this die, it may be noted that the pilot holes will be pierced at the first station, and that a continuous line of pilot holes appears near each edge of the scrap strip. A spring plate, which is located at the extreme left end of the die, strips the work from the punch, in ascent, just before a jet of air blows the finished work out of the die.



## Bumper-pins

The work strip is fed into the die from the right to left, which is the usual feeding direction for progressive dies. The exception to this method of feeding may be found in the Multi-slide machine in which the strip is fed into the die in the opposite direction. There may be other cases in which

the completion of the down stroke, all of the faces of the punches and dies will be located at their proper working levels. Bumper-pins also aid the die-setter in setting up the die in a press. They also enable the die-setter to determine the closed height of the die at once, and thus eliminate the necessity for making many trial cuts to determine the correct closed height. An-

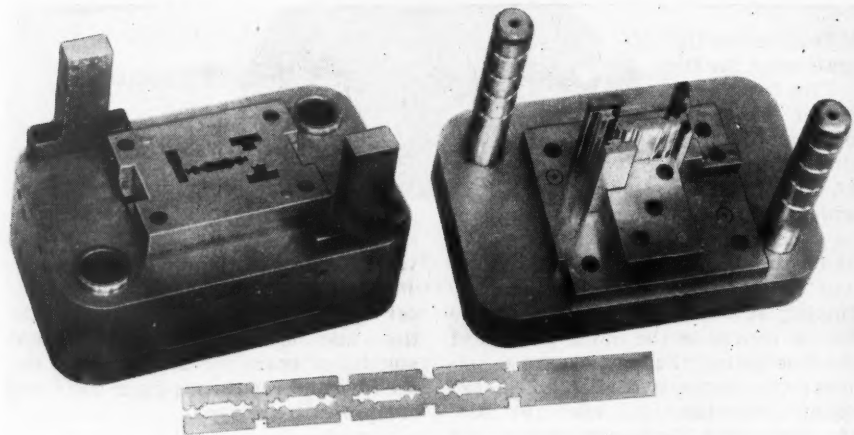


Fig. 14—Illustration showing a short length progressive die which is designed for producing razor blades. The blanking center distance is 1-11/16 inch, the length of the razor blade.  
(Photo Courtesy Moore Special Tool Co., Inc.)

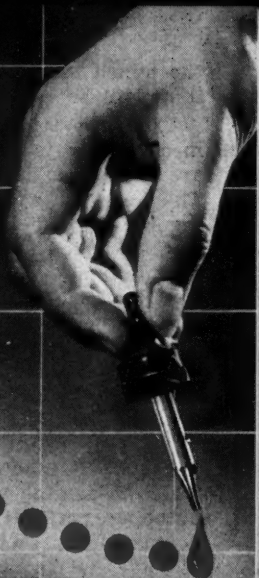
the strip is fed from left to right, however, such cases are usually those in which the die is equipped with guide posts which are located at the rear and which interfere with the sliding of the finished work from the die. Obviously, if the die is turned around, and fed from left to right, the guide posts would be in front, and would therefore not interfere with the ejection of the finished work.

The punches and dies are aligned, in the die under discussion, by means of two guide posts, and the two shorter posts near the center of the die shoe, are the bumper-pins. The bumper-pins serve to check the downward movement of the punch holder so that at

other advantage of bumper-pins may be found in the compensation for loose action which they provide in the press ram—loose action which may be due to a worn press slide. It is advisable to provide all progressive dies with bumper-pins.

By means of this die it is possible to produce approximately 50,000 workpieces per grind, although more than this number of workpieces can be produced before the die must be reground. Several of these dies are now in use, and the only disadvantage was found to be in the size of the piercing punch which is relatively small as compared with the thickness of the tool steel material strip. This condition caused





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the punch to break occasionally, and it had to be replaced.

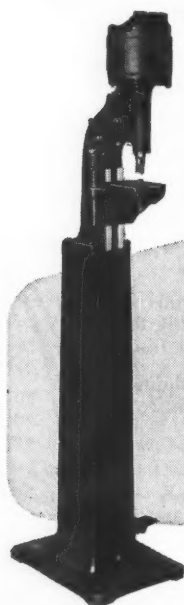
The work strip is fed into the die by means of a pair of feeding rolls, which are mounted in an automatic feed unit. The feed unit is located at the receiving end of the die. Dies of this type are frequently fed by means of a Dickerman automatic hitch feed, a type of feed in which rollers are not used. This job has been operated in a Henry & Wright Dieing Machine which produces approximately 15,000 finished pieces per hour.

#### Die for Razor Blades

Figure 14 shows a view of a die which is assembled with punches for notching, perforating and cutting off double-edged safety razor blade blanks. The rectangular studs which are located at the diagonal corners of the die shoe serve as "bumper-pins." The upper ends of these bumper-pins

contact the punch holder face as the press ram descends and thus determine the closed height of the die; they also aid the diesetter in setting up the die in the press.

Additional features of the die shown in Fig. 14 include guide posts which are press fitted in the punch holder, and guide bushings which are press fitted in the die shoe. The primary reason for reversing the location of the guide posts and guide bushings is to assure that the guide bushings will be located at a distance ahead of the press ram which is greater than that found in a conventional die set. The use of inverted guide posts therefore provides the most practical method of guiding the punches straight into the dies. This principle is often applied to dies in which thin and hard materials are pierced and blanked and where little or no punch clearance is available.



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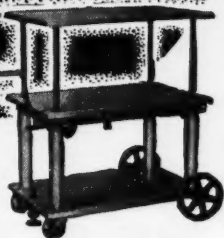
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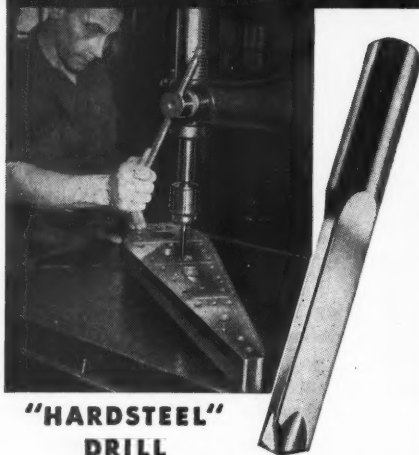


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### Die Built Up in Sections

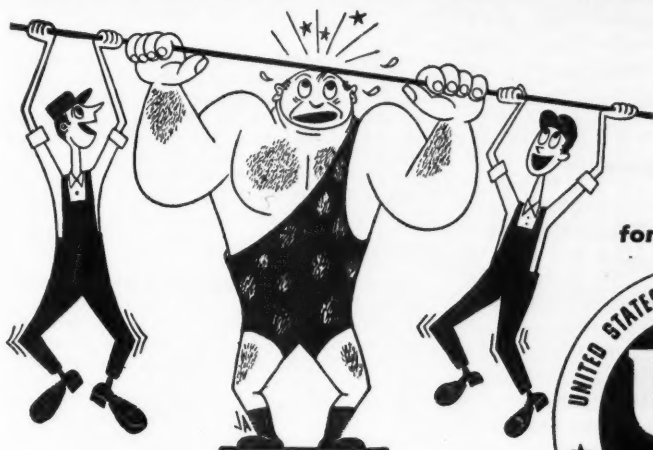
If the positively attached stripper plate of this die were removed it would reveal sectional die blocks which have been "sunk" deep into the die shoe. The parting lines between the sections are arranged so that half, or a part, of each die opening is in a block by itself. This construction feature exposes the interiors of the die contours and thus provides easy access for grinding. The surfaces of the die openings must be precision ground all the way through the blocks to ensure that accurate blanks will be cut at all times or until the die is worn out by repeated regrindings. Each die section is fastened to the die holder by means of two socket-head type screws and suitable dowel pins.

### Construction of the Die

This die, designed and built by the Moore Special Tool Co., was considered a most difficult one to construct. The work strip is of 0.012-inch gauge special crucible tool steel strip, having a 1.10 per cent carbon content. This metal is difficult to cut in almost any kind of die. Further, specifications by the customer stated that no perceptible burrs would be tolerated on the blanks, and that 125,000 blanks must be cut between grinds. These rigid specifications indicated that the punch die clearances would have to be maintained between 0.0002 and 0.00025 inch.

The die blocks are 1  $\frac{1}{16}$ -inch thick and are designed to cut blanks accurately until worn down to approximately  $\frac{1}{2}$ -inch thickness. Die draft is about 0.00015 inch on each side. In production, the die blocks will outlast two or three sets of "form ground" punches. Approximately 40 small radii are required on the punches, and including the dies, the total radii is 80. Most of the radii were only 0.005 inch. These radii and all connecting sur-

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faces must be form ground in order to obtain the proper clearances and fits. "Stoning" of these surfaces is not permitted, due to the risk involved of creating low spots or "holes" on the sides of cutting members. Only a highly skilled diemaker with many years of experience in the building of precision dies would attempt to do this kind of precision work.

#### Order of Operations

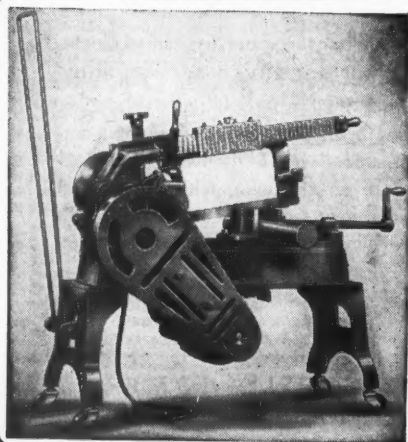
The strip is passed through straightening rolls in which waved portions are removed and is then fed into the right end of the die at the notched opening which is shown in the channel of the stripper plate. The consecutive operations are: Notch the edges of the strip, perforate center opening, pilot and cut off. Upon the completion of these operations the blanks are blown into a container by means of compressed air.

The die is used in a high speed press which is equipped with automatic double roll feeds. Output is approximately 300 blanks per minute.

"Make Safety Pay" is the title of an eight-page two-color folder prepared by Flohr Safety Equipment, Inc., Dept. MM S, Buffalo 17, N. Y., which fully illustrates and describes the construction features, application, operation, and so on, of the Flohr Automatic Radial Guard for use on all horizontal portable tools. Copy free upon request.

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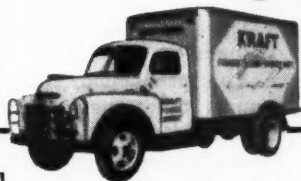
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# Human Freedom

(An address presented before the American Supply and Machinery Manufacturers Association Convention at Atlantic City, April 27, 1948)

By DR. RALPH C. HUTCHISON

President, Lafayette College, Easton, Pennsylvania

**I** HAVE been very much interested in the development of the theme for this convention—"Today's Preparation for Tomorrow's Problems." That means something to me, and I am here to suggest in regard to our nation and our government that the best preparation for the solution of tomorrow's problems is an understanding today of the problem which must be solved tomorrow. I am not concerned about the solution tomorrow if we can only understand the problem today.

In my judgment we may fail at solution because we misunderstand the issue. We think that there is a great ideological conflict in society between communism and capitalism, and that this is what all the shooting is about. From that premise we proceed to the conclusion that men are contemplating communism in their several countries because they are hungry or because they are attracted by the various promises and hopes of communism. Then we conclude that since this is the case, their tendency toward communism can be stayed by sending them food and farm machinery and

economic aid. Having seen the same world wooed and almost won by Fascism, it is amazing that we can be lulled into the idea that this is an ideological conflict between communism and capitalism.



Ralph C. Hutchison

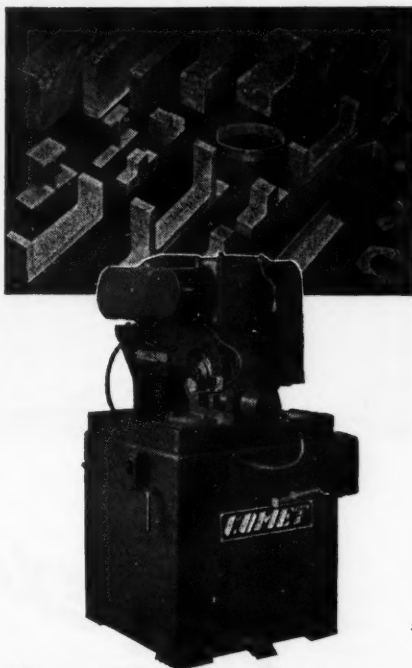
This problem of tomorrow is something far more sinister than communism and involves a conflict far older than the concepts of Karl Marx. The conflict in the world now is not that between two academic economic theories. It is rather the conflict between human freedom and human slavery, the conflict between despotism, tyranny and dictatorship on the one hand and Christian democracy on the other.

This is the battle in which our forefathers died, in which the saints and martyrs have struggled. This has resounded down the ages. This was the battle in the First World War. This was the issue when the forces of enslavement appeared under Hitler. And it is only an incident of the trifling significance that these forces now appear under the guise of communism. In fact, they wear the guise of communism to deceive us. It is the wolf

in sheep's clothing, slavery parading as an economic idea.

It is shocking to think that the old battles of human history have not been won. We thought they had been. We thought that the battle against slavery had been won, but there are more men in human slavery today in Russia and the satellite countries than ever before. We thought men had a right to live, but there are those who estimate that perhaps five thousand men and women are done to death each day in order to force men to intellectual subjection to this new despotism. We thought religious freedom had been won, but men are not free in most parts of the earth to worship. We thought men were to be free to vote, but they dare not vote anything but "ja" in much of the world. The ancient battles of humanity are not over. These victories are still to be won.

The oldest concept of government held that man was the pawn and slave of the state, that the corporate good was the only value in life, therefore, that the state was supreme. The individual had no personal or integral significance. This idea dominated the ancient kingdom and empires. Then there began to emerge another idea. It was implied in the ancient scripture of the Hebrews. It appeared in vivid form in the teachings of Socrates who suggested that man was divine and was, therefore, more significant than the state. For this revolutionary idea he died. Then came Christ who proclaimed this heresy as no one else had even spoken. He maintained that the whole creation, that God Himself, was concerned not with the state, not with the Kingship, not with the corporate body or the corporate good but with the individual man, woman or child. For this He died. And for this His followers were driven, tortured and killed. The Roman Empire did not object to a new religion, but it did object most strenuously to

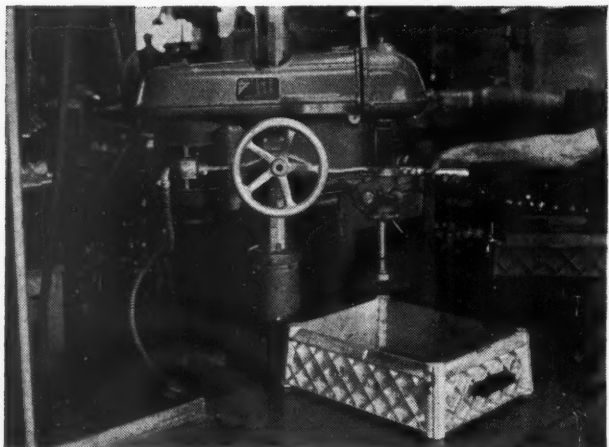


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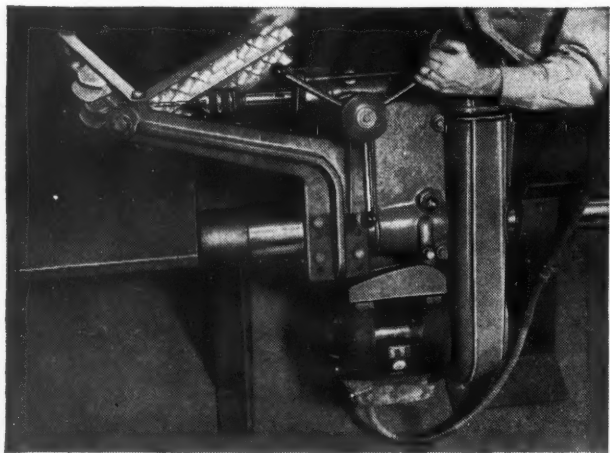
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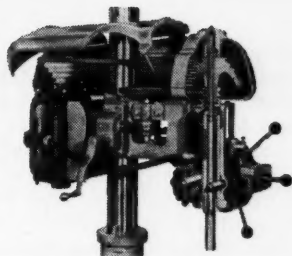
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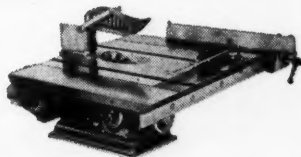


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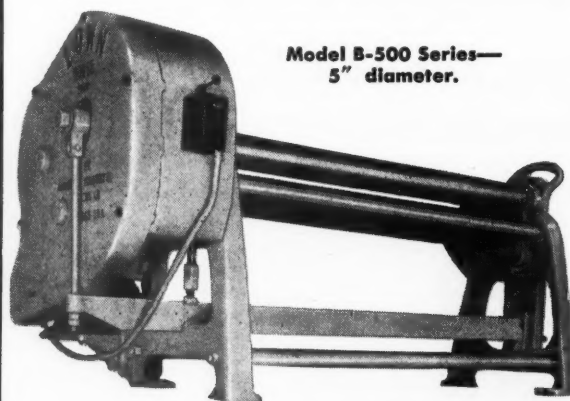
the revolutionary doctrine that individual men had rights over and above the State.

So down through the ages came the concept on which Christian Democracy was finally established, namely, that man is the son of God, that he, individually, is the supreme value in the whole created universe, that he is more important and more significant than any king or congress or army, that he is eternal and all other things are temporary. This idea lifted the heads of serfs, slaves, political prisoners, and the downtrodden. This concept gave men the flashes of hope resulting in great historic efforts for freedom. This principle finally resulted in the Magna Charta and the Declaration of Independence and the Bill of Rights and the Constitution of the United States. This concept of the supreme value of the individual resulted in the United States of America.

The meaning of this great truth is

that man is created free and that he has certain inherent rights. These rights are not given to him by any Magna Charta or Declaration or Bill of Rights or Congress. They are simply recognized by these instruments. With these rights men "are endowed by their creator." They are "inalienable rights" and can be taken away by no dictator, no Hitler, no Stalin, no president, no congress, no court, no majority, no plurality, no labor union, no corporation, no mob. These rights we know well—life, liberty, pursuit of happiness—freedom to speak, to read, to think, to assemble, to vote, to work, to own, to give. These rights are the total antitheses of human and political slavery under the dictatorship of anybody, Hitler, Stalin, the proletariat or anyone else.

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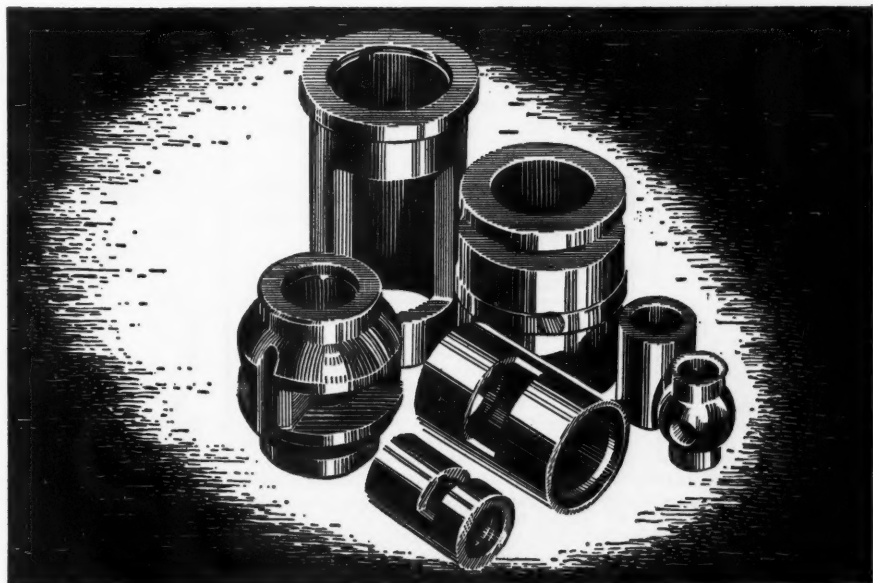


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through fair trade. They want that which another has or which they think he has. Finding that he does not have enough for their greed, they steal him and his labor by putting him in subjection. This becomes slavery, the purpose of which is to produce for the gangsters of life what they want and what they are not willing to produce for themselves. And any attempt to free men from slavery and any thought contrary to slavery is political crime.




And so with a few new words and modern trimmings we have again the ancient tragedy and conflict. The gangster leaders of Russia are the latest champions of despotism. They destroyed first their own wealth and their middle class in the childish expectation that they would find wealth to be distributed to the proletariat. But they found that there was no wealth when the producers of wealth were destroyed. So the gangsters then

enslaved their own people, thinking that this would produce wealth. But slavery did not produce and Russia starved and sank to the lowest standard of living it had ever known, so low in fact that the government has labored for years behind an iron curtain to conceal this fact from the world and its depth from its own victims. And the armies of enslaved mentalities were helpless, helpless before England, helpless before Germany and saved at the last minute by the prodigious aid of America in arms which Russia could not produce, and incidentally, cannot reproduce.

Then came victory won by the nations of free peoples in unfortunate and evil alliance with the despots of Russia. These despots and gangsters found their own land pillaged by another slave nation, their people hungry and incapable of production. They turned then to prodigious looting in which they had the disgraceful con-

# Severance

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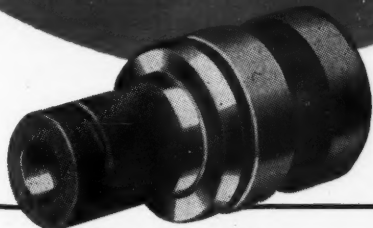
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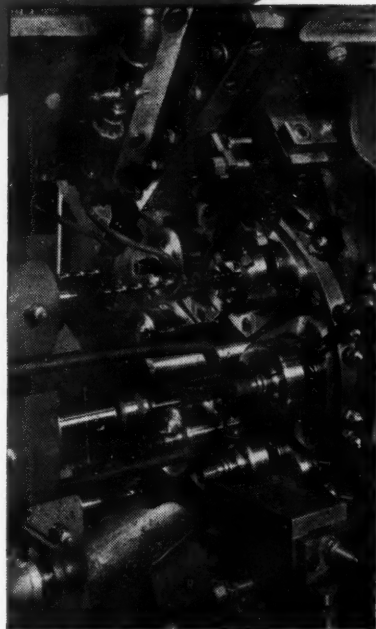
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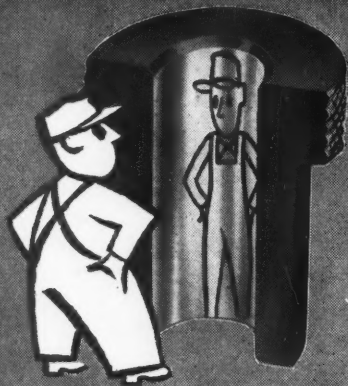
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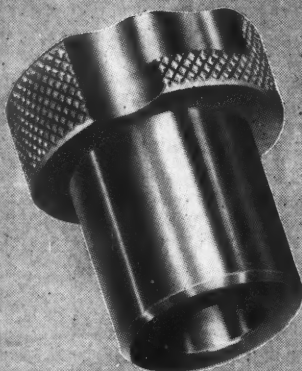
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**UNIVERSAL ENGINEERING CO.  
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sent of America. One nation after another was conquered, decimated, enslaved and systematically looted while we quibbled about tolerance to Communism, while we toyed with academic, economic ideas. Today all of Europe and Asia is threatened, not by Communism but by conquest, slaughter and enslavement of a hungry, looting horde who profess communism as a bait and a trick for the ignorant.

Not only is Europe and Asia threatened but all the world. This conflict is basic, between freedom and slavery, not between two nations, or "two worlds," or two economies. And this world cannot remain long half slave and half free. Either democracy, the rights of man, will reassert themselves and free mankind or slavery will enslave mankind. And this includes America.

Someone asks how this enveloping human slavery could include America. It could do so because democracy is always vulnerable. It is vulnerable just because men are free. In their freedom they differ in judgments and make those differences effective. They split up in many parties while the enslaved are firmly united in one party. Democracy is vulnerable because men are free and those enemies within are free to teach and plan the overthrow of democracy. Democracy is vulnerable because human freedom means freedom to work or to starve, to gain and to lose, to risk and to go broke. This means danger and uncertainty, and many would prefer the fancied security of the slave state to the risks and struggles of freedom. Democracy is vulnerable because men are free to be corrupt in government, free not to vote, free to indulge in greed and passion, free to waste their resources in dissipation. Democracy is vulnerable because men are free to form into great pressure groups which can use force and can strike and demand that they get theirs



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## **Make Your Industrial Lubricants Carry Your Production Costs More Efficiently**

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whether anyone else does or not. Democracy is always weak and vulnerable and has disappeared almost everywhere else on earth. Democracy can disappear here. As men have been enslaved in their actions and in their labors in Germany, in Russia, in Czechoslovakia, in Roumania, in Hungary, they can also be enslaved here.

I am not attempting to say here what should be done. You have asked what today's preparation is for tomorrow's problem. I am suggesting that it is first to understand the problem, the issue which is before the world. The issue before the world is not capitalism and communism—it is human freedom. America should reconsecrate itself not to self-defense, important as that is, but to the defense of mankind.

Italy alone is not threatened. Mankind is threatened. Human freedom is at stake. America confessedly without a foreign policy should adopt one—the freedom of the world. Whether or not we must go to war, whatever we may do with huge funds, and whatever diplomatic means may be used, with or without the United Nations, let America devote itself with one passionate consecration that mankind in America may remain free in democracy, that mankind in western Europe may remain free, that mankind in Finland and Italy and Greece and Turkey and Iran and China and Korea and Manchuria and Japan may be and remain free. More than that—that mankind in Roumania and Czechoslovakia and Poland and Russia, yes, and even Siberia, may some day again be free to think, to work, to read, to hear, to assemble, to speak, to worship and even to vote “no.”

### **Austin Motors Adopts Sweepstakes to Step-up Production**

**A**CCORDING to the Wall Street Journal, Austin Motors, England, is starting weekly firm-financed sweep-

stakes for its 16,000 employees, in addition to its regular bonus payments. The idea is to step-up production.

The lottery, held every week, is based on the number of autos leaving the factory compared with the previous week. “Sweeps,” which consist of drawing five employees' names from a drum, are based on a minimum weekly output of 1,700 vehicles. When production reaches 2,200 autos, first prize will be \$1,050; second, \$525; third, \$262; and fourth and fifth, \$131 each. Awards increase gradually as production increases.

To qualify for “sweeps,” workers must be employed by Austin for at least three consecutive months, be entitled to the firm's punctuality bonus and have done their full stint in helping boost auto output. Workers must pay income tax on their winnings.

Incidentally, the British manufacturer of Austins claims it is sending more than 1,000 cars a month to the United States.

“American Standards.” An up-to-date list of all national standards approved by the American Standards Association has been published and is now available free of charge. The American Standards listed have been developed through the procedure of the American Standards Association by the national groups in each of the fields covered, ranging from civil engineering and construction, mechanical engineering, and electrical engineering to chemicals and textiles. The “all party-at-interest” procedure of the Association has assured their acceptance by a consensus of all groups concerned and has given the standards included in this new list the standing of “American Standards.”

The list includes national standards for such important problems as dimensions of machine tools and parts, rating and testing of electrical equipment, dimensions and identification of pipes and piping, building code requirements, industrial safety and health, occupational clothing, photography, and definitions, abbreviations, and symbols used in technical literature. Copies of the list can be obtained from the American Standards Association, 70 E. 45th St., New York 17, New York.



Subject: FILES for LATHE FILING

## "THE RIGHT FILE FOR THE JOB"

conserves materials, saves workmen's time, improves results—cuts production costs. This is one of a series of advertisements on special-purpose files. Save it, with the others, for shop and purchasing references.

Prepared by Nicholson File Co.



Long Angle Lathe File



Mill Bastard File



Lathe Filing

**LONG ANGLE LATHE FILE VS. MILL FILE.** In the years past, a regular Mill Bastard file was used frequently for lathe filing; and it is still recommended if the filer is not thoroughly experienced, for the Mill file is a little easier to use than the Long Angle Lathe file. However, the teeth of the Mill file have a tendency to fill up with chips. In the Long Angle Lathe file, this difficulty has been reduced by increasing the angle of the teeth from 25° to 45°. The chips slide down the longer angle and are forced out at the edges by the forward motion of the file. Virtually self-clearing, the Long Angle Lathe file does the work rapidly and leaves a smooth finish.

**HOW TO USE.** In holding the file against work revolving in a lathe, it should not be held rigid or stationary but should be stroked constantly to distribute the cutting action throughout the file. Operator should stand at right angle to his work and be sure his arms and hands are placed so there is no danger of their coming in contact with any moving part of lathe or piece. Pressure should be applied gently at first and increased gradually.

**CONSTRUCTION AND APPLICATIONS.** Every Nicholson and Black Diamond Long Angle Lathe File is rigidly tested to see that its surface is level and free from hollows that would cause scratches or grooves in the work. Made in Flat type, with "Long Angle" stamped on shoulder.

Write for "FILE PHILOSOPHY"—free 48-page book on files



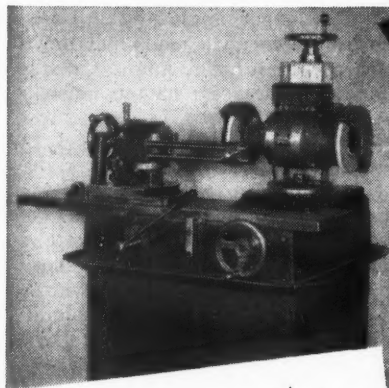
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(In Canada, Port Hope, Ont.)



# NICHOLSON FILES FOR EVERY PURPOSE

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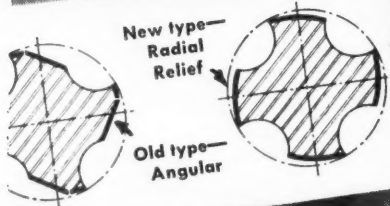


## DS

### RADIAL RELIEF GRINDER

**1 TO 14 FLUTES IN  
COLLET, CHUCK or CENTERS**

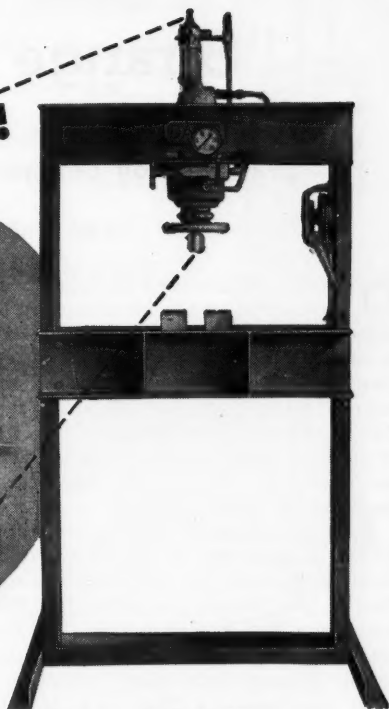
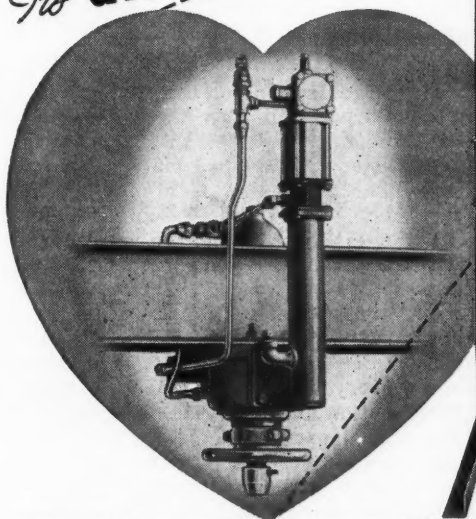
Faster cutting, better finish, more cuts per grind, better blade support, are obtained with radially (eccentric) relieved tools. Every week some new industry orders a D-S for grinding taps, counterbores, step drills, center drills, profile mills, reamers, gear tooth rounding cutters, etc. Any good grinder hand can operate it.



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**25, 50, or 75 tons with 90 or 145 lb**

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Please rush me details of your new air-operated presses.

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# "Strange Interview"

A training film in which the human relation principles practiced by Benjamin Franklin are stressed

By LYNE S. METCALFE

ONE of the primary factors to be considered in the maintenance of harmonious working conditions in any shop involves the development of a pleasant and understanding relationship between employer and employee. The question is; How shall the employer fulfill his part of the responsibility in fostering and maintaining these harmonious working conditions.

It is said that Benjamin Franklin knew the basic requirements of maintaining harmonious relationships and that he practiced them in his day. His know-how has now been made the basis for a new sound motion picture, titled "Strange Interview," which has been produced by The Jam Handy

Organization for the General Motors Corporation. This film is being shown upon request, free of charge, to interested groups in the machine shop field. The screen time is 55 minutes. In the film, Benjamin Franklin is reincarnated in order that he may show how a machine shop can be operated efficiently and with harmony between boss and worker.

In this motion picture "patterns" for "handling" operators in certain everyday situations are presented by action and dialogue. Situations in the smaller type of machine shop are presented to illustrate the type of situation in which more guidance is needed. Altogether, the film emphasizes the problems that may arise in the average shop as a result of disharmony.

The four main characters in this film drama which is laid in a "small




Scene from Strange Interview, a film depicting Benjamin Franklin's methods of maintaining harmonious working conditions in a shop.

Berger Mounts All Machinery  
in New Plant on

# UNISORB

Saves Floors from  
Needless Drilling Damage



Cincinnati No. 2 Cutter-Grinder (left) and Kearney & Trecker Milwaukee Model K Horizontal Milling Machine (right) anchored on UNISORB at Berger Machine Company, Maspeth, N. Y. Formerly, Berger anchored machinery with lag screws on wood floors or with bolts set in holes in concrete floors.

The Berger Machine Company has mounted all machinery in its new plant the modern way... on *Unisorb*.

UNISORB-Mounting is equally effective on all types of flooring and with practically every kind of machine.

It requires no bolts, no lag screws — and none of the old-fashioned, destructive floor drilling. A special cement bonds the UNISORB pads to the machine feet and the floor with a holding strength of 1500 lbs. per square foot *minimum*. Permanent set absolutely prevents any riding.

By absorbing from 60% to 85% of transmitted vibration and noise, UNISORB cuts building maintenance costs, protects machinery, reduces down-time.

And by providing quieter surroundings, UNISORB-Anchoring eases fatigue, helps people work better.

Write for sample and specifications. Ask for your copy of "Why It Pays To Anchor Your Machines With UNISORB."



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Scene from *Strange Interview*. Bill Parker, owner of a small machine shop, discourteously withdraws his promise to promote one of his employees.

gement and worker in the average business and how they may be avoided.



Inasmuch as people are the same everywhere, AS people, and react in much the

business" workshop are Bill Parker and his wife Mary, Ed Campbell, Bill's friend, and Benjamin Franklin, "reincarnated," who calls attention to the sources of friction between mana-

same manner to identical conditions whether in a saw mill or an ice cream parlor, the message of this movie is applicable to any line of business today. The story is about



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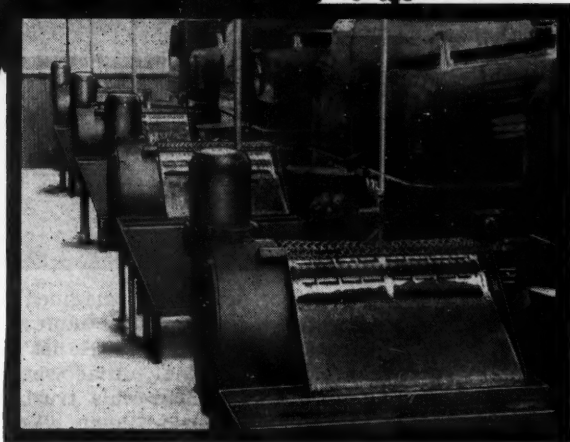
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AUTOMATIC COOLANT  
SEPARATOR ON GRIND-  
ING OPERATIONS...

Example: Landis Thread Grinder



Machine shut downs for clean out and maintenance are costly and hinder productive output on certain types of operations such as honing, grinding, shaving, and shaping. The accumulation of fine sediment and swarf rapidly plugs coolant lines, seriously effects work finish, and destroys coolant life. Machines on these operations must be shut down frequently to keep them clean and operating efficiently.

**BARNESDRIL** Automatic Coolant Separators, installed on a battery of Landis Thread Grinders, have eliminated this maintenance problem and increased operating efficiency as much as 90%. A No. 4 Separator is installed on each machine and removes an average of 60 pounds of swarf from each machine every 8 hours. As a result, a constant supply of clean coolant is assured and both direct maintenance costs and valuable production time have been saved.

Capacity of this No. 4 Separator supplies 40 gallons of clean coolant per minute. Other models range from 5 to 100 gallons per minute. Check your requirements for maintenance and sludge removal. A **BARNESDRIL** Automatic Coolant Separator will improve machine performance and efficiency.

Write for Bulletin B 151 E.

## **BARNES DRILL CO.**

860 CHESTNUT STREET ROCKFORD ILLINOIS U.S.A.



Bill Parker loses his temper while instructing one of his workers in *Strange Interview*, a training film on human relations.

people, not about machines, or products.

The film is a tribute to Benjamin Franklin. It reveals for instance, that this great man admitted that he had "a tough time getting along with people, getting them to go along with him in the things he set out to do." But he tried hard and finally succeeded in his efforts. Franklin learned through many experiences that to get the cooperation of a man, you must treat that man as an individual—as a fellow human being. And out of these difficult and sometimes costly lesson-learning experiences came a rich philosophy of living—a philosophy as practical today as when Franklin practiced it.

In the film story, in managing his shop, Bill Parker certainly wasn't practicing Franklin's philosophy. In dealing with people, Parker thoughtlessly "rubbed" them the wrong way. Production decreased and quality of product fell below standard. He lost business.

Bill became worried and irritable,

imagined his employees were wholly at fault.

He let his anger blind him so much that when he said to Ed Campbell, his trusted friend and former foreman, "You mean that you think my trouble here is. . . ?" and Campbell replied "You," Bill didn't tumble even then. On the other hand he decided he'd really get tough with his men, that is until, through the magic of a dream, he saw how wrong he'd been.

The picture contrasts Bill Parker's way of dealing with men with Franklin's way. Under somewhat similar circumstances, Parker does the wrong thing, while Franklin does the right.

Here are a few examples: When Parker discovers one of his men reporting late for work, he will not let the man explain, but simply growls: "Don't let it happen again!" On the other hand, Franklin questions his tardy employee and, after learning that the illness of his wife has made the workman late, sympathetically expresses the hope that she will recover her health soon.

## TIPS ON USING ROTARY FILES AND BURS

**N**ICHOLSON spares no care, expense or detail in making the most efficient Rotaries that file engineering and manufacturing can produce. Nicholson is equally interested in your getting the most out of them. The suggestions below should help the user toward best results. Your industrial distributor can give you



further helpful service — both in selecting the right shapes, cuts, and sizes for your needs and in supplying them at prices that give you unsurpassed values.

- 1 Move the file or bur at an even rate and pressure to avoid the "hills and dales" which will show up if an unsteady pressure is applied.
- 2 The speed at which the file or bur can be driven depends to a great extent on its diameter. The smaller it is, the faster the speed. (We will be glad to meet your request for charts of approximate speeds of high-speed steel Rotary files and Ground Burs and Carbide Ground Burs for general applications.)
- 3 Be sure to use sharp files or burs. Never overlook the fact that the operator's time is the big cost item, and that he needs well-sharpened tools. (Nicholson provides an excellent sharpening service for burs and a conversion service for making burs from worn Rotary files.)
- 4 Use a short grip on the shank for accurate control, and a longer grip for reaching out-of-the-way places. Although the standard length shanks will do the majority of jobs, other lengths can be secured for special cases.
- 5 Normally, medium cut files and burs will give sufficient stock removal and acceptable finish to meet most needs. However, if heavier cutting or stock removal is required, coarse cut should be used; and correspondingly, the fine cut should be selected if a very smooth finish is required.
- 6 Excessive pressure shortens bur life and does not materially add to stock removal. Use a firm pressure and allow the tool to do the cutting.

**NICHOLSON FILE CO. • 93 ACORN STREET, PROVIDENCE 1, RHODE ISLAND**  
(In Canada, Port Hope, Ont.)

**NICHOLSON ROTARY FILES**

Hand Cut and Machine Ground • High Speed Steel and Carbide

**NICHOLSON  
U.S.A.**

When reminded by one of his employees that he had been promised a change of job, Bill considers it just a gripe and says: "I know what I promised, but it just so happens that something has come up that—well, you'll just have to stick to your present machine for a while, that's all." Franklin, however, says to his employee who is thinking of a job change: "Jim, I make it a point not to forget promises. Yes, I did promise you a better job in the shop, but since making that promise something has come up that'll make the job you're on now one of the best in the shop. I thought you'd want to stay on your present job as this new work comes through to see how it works out. I was going to speak to you about it today."

"Charlie," says Parker, stopping before a machine, "what are you doing?" "Well, Mr. Parker," Charlie replies, "you said I should do it this

way." "No—no—no!" says Bill gruffly, "That's not the way at all! No wonder such poor stuff has been coming through! Look—watch what I'm doing and I won't have to go over it so many times."

"Charlie," says Franklin to one of his pressmen, "I think we can work out a better way—a way that will result in fewer spoiled sheets." "But, Mr. Franklin," exclaims Charlie, "last week you said I should try doing it this way." "Well, then," Franklin replied, "maybe I've learned a little since last week. Perhaps if we feed the paper this way. . . How does that seem to you, Charlie?" Charlie: "I didn't quite get the way—" Franklin: "I'll go over it again."

After Franklin has stated that "failure to get along with people—failure to get people to cooperate with you—can cause many kinds of hardships," Bill asks for "a few inside, sure-fire tricks."

# "Standard"

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FOR HOT OR COLD  
ROLLING OF STRIP,  
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TONS, ROLLING MILLS,  
SWAGERS, TURKS HEADS.**

**STANDARD MACHINERY COMPANY**  
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"First, let me ask you a few questions, Bill," replies Franklin. "For instance, do you always keep your promises? Do you always give sufficient reasons for changing a decision so the change will be understood? Do you refrain from sarcasm and a domineering attitude? Do you avoid constantly bringing up the faults of your fellow man? Do you always make a real effort to understand his viewpoint?"

"The secret of getting along with people and getting them to go along with you, Bill, is simple and as free as the air you breathe. It's simply treating them with consideration. But it's no easy thing. It requires effort—a lot of it, and you've got to be sincere or you won't get anywhere. But it's worth everything you put into it, if only because it makes your task of working with people so much easier, so much more pleasant."

For details as to showings of this film address Film Section, General Motors Corporation, 9-252 General Motors Building, Detroit 2, Michigan.

**"Handling Materials - Illustrated."** According to an announcement made by the Towmotor Corporation, "Handling Materials," a publication devoted exclusively to the science of materials handling, has assumed an entirely new format in its initial 1948 issue and is now known as "Handling Materials - Illustrated." Changes in the publication include a tabloid format which permits the use of more and larger photographs. The copy is brief and terse, with more space being devoted to sequence illustrations of actual handling operations in every type of industry. A reply card enclosed in each copy offers additional detailed information on each of the several suggestions covered in each issue.

Requests for copies of Vol. VI, No. 1, and subsequent issues of "Handling Materials-Illustrated" may be addressed to the Towmotor Corp., Dept. MMS, 1226 E. 152nd St., Cleveland 10, Ohio.

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For stamping into Metal, Wood, Fiber and other materials.

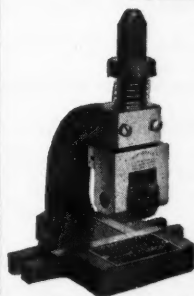
Also supplied with ALL Wheels Quick Change



Can be furnished with any number of wheels up to 20. With Two Wheels, the "Unit Wheel" and the "Tens Wheel" can be turned by using the two outside knobs to quickly set the required number. This greatly facilitates consecutive numbering.

BULLETIN MS-85.

## NUMBERING MACHINE PLATFORM 45



For stamping fixtures, letters and fractions with uniformity and speed into brass, aluminum, zinc, unhardened steel, iron, etc. This method is faster than stamping with hand stamps, mono-wheel presses or type. Platform furnished with adjustable guide and thumb screw adjustment, enabling operator to locate the plates or tags with precision and speed. Stamp can be taken out of holder for stamping larger objects. Characters always properly aligned; of uniform depth.

BULLETIN MS-45.

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Dependability is built into Winter Taps by a carefully coordinated research program. This includes research into raw materials, heat treatment methods, and performance records in the laboratory and in the field. This interlocking research program keeps Winter Brothers abreast of the latest developments in the art of metal cutting. It assures you better performance and longer tool life when you specify Winter Taps.

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YOUR LOCAL DISTRIBUTOR carries a complete stock of Winter Taps on his shelves — as close to your tapping problems as the telephone on your desk.



Winter Chip Driver Taps are designed for fast operation in tough alloys. They are part of Winter's complete line of carbon and high speed steel taps and dies.

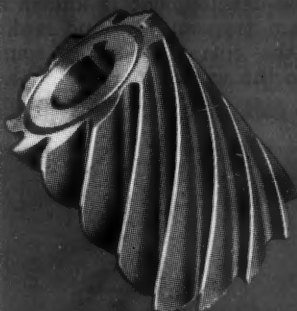
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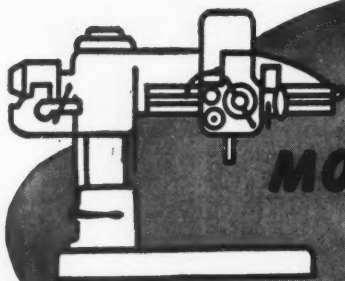
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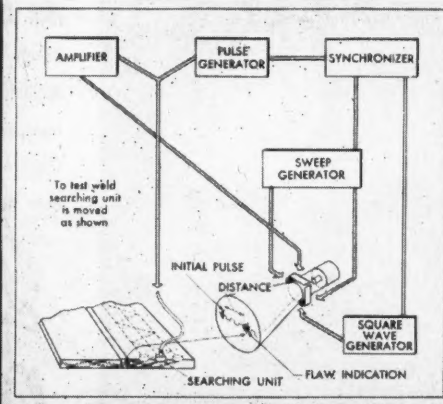
## MODERN EQUIPMENT AT WORK

### Testing Welds with Supersonic Waves

**W**ELDS in ferrous metals and light metals can be inspected for lack of bond, inclusions or voids by means of a newly developed testing technique employing high frequency sound waves generated by a Super-

sonic Reflectoscope, according to an announcement made recently by Sperry Products, Inc., 1505 Willow Ave., Hoboken, New Jersey.

The new development is known as angle beam transmission and makes possible the entrance of the sound beam into the welded part at an angle. The searching unit, whose pri-



The searching unit of the Reflectoscope is aimed at weld line and the pulsating sound beam projected through the weld. Block diagram of Reflectoscope operation is shown in the insert.

mary element is a quartz crystal, can be placed on the smooth parent metal adjacent to the weld, or even at some distance from it. The energy travels by successive reflections between the surfaces of the material until an interface is reached. The weld metal itself will not constitute a reflecting interface, but any voids or inclusions will reflect part of the sound beam back to the searching unit where it will be amplified to provide a vertical deflection of the horizontal trace of an oscilloscope screen. A time marking system allows accurate calibration to determine the distance from the searching unit to the flaw, and it is thus possible to distinguish between any defects in the plate and those in the weld area.

With the Supersonic Reflectoscope it is possible to locate smaller defects at greater depths than with X-ray or other non-destructive testing equipment. Also, by controlling the sensi-

tivity of the instrument, defects or voids too small to affect the efficiency of the weld can be by-passed.

Since sound waves travel equally well in aluminum and magnesium as in ferrous metals, welds in light metal plate and sheet stock can also be inspected. Depth of penetration in these metals is comparable to that in steel and defects of the same small size can be located if desirable.

## Induction Hardening Outboard Motor Shafts

**C**HAMPION Motors Company, Minneapolis, Minn., selectively surface hardens the drive and propeller shafts of outboard motors with Ther-Monic Induction heating equipment. The equipment consists of one Model 1070 Ther - Monic Induction Heating Generator and one single position Ther-Monic Work Table equip-

**For ANY Size Machine**  
**Chandler-Duplex**  
**COMBINED Boring  
and Facing Toolhead**

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**A Boring Head That Won't Face Is NOT Complete**

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**MUNCIE, INDIANA, U. S. A.**

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may be a major control factor in your search for greater production — reduced costs. Milford Rivet's superior fastenings are made of the finest materials available — precisely finished — minutely checked against rigid specifications.

*Milford's complete line of*  
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has cut production costs for thousands — let it serve you.

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# MILFORD

## RTV-TT

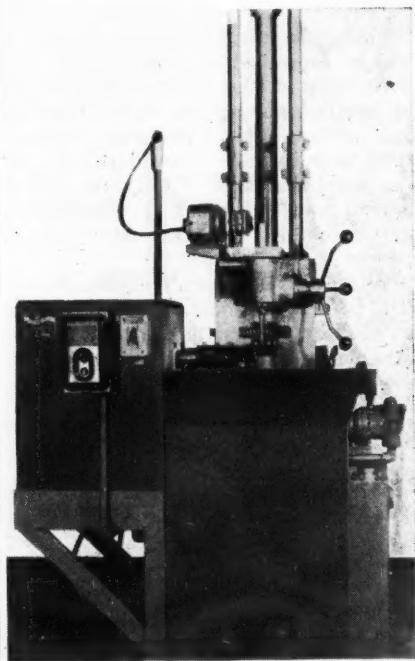
### & MACHINE COMPANY

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MILFORD, CONN.

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ELYRIA, OHIO

ped with an automatic progressive feed and spray quench, manufactured by the Induction Heating Corporation, Brooklyn, New York.

The heating operation and the rate of progression of the piece through the work coil are automatically controlled by a series of dogs which actu-



View of Ther-Monic Induction Heating unit which is Designed for Hardening Champion Outboard Motor Shafts

ate the high frequency generator and a hydraulic valve. The dogs can be adjusted to accommodate either the drive shaft or the propeller shaft or a wide range of similar parts. The vertical motion of the progressive feed is hydraulically powered by a self-contained pumping system.

The work is loaded when the fixture carriage is in the "up" position. Upon

Towers are measured by their shadows—(Old Proverb)

# TAP EFFICIENCY IS MEASURED BY THE SHADOW OF PERFORMANCE

A True Guide  
To Economy

*Sustained Accuracy*

## HY-PRO Taps

stay accurate longer.

Their rugged construction, precision grinding and special heat treatment effect definite production economies through longer wear between sharpenings. Consistently producing more accurately threaded pieces per tap,

these high production tools stay on the job longer to lower the cost of your tapping operations. In addition, their "sustained accuracy" permits the assembled parts of your product to be fastened tighter and stronger to resist the loosening effects of vibration. Specify HY-PRO . . . test them competitively on your toughest assignment . . . prove their greater efficiency and economy.

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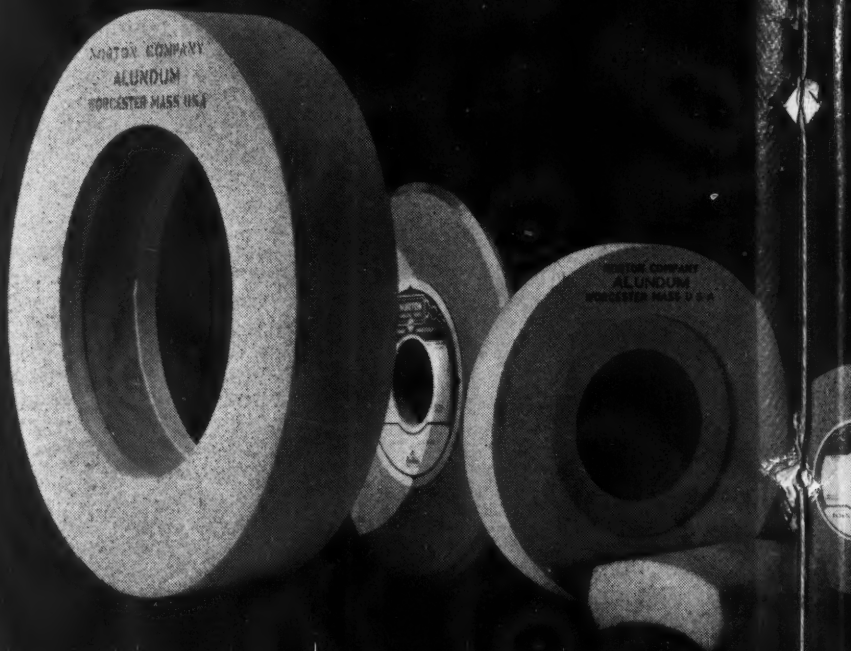
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New Bedford  
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**32** ALUNDUM abrasive is entirely different from any other abrasive — made differently by a unique Norton-developed process. There's no crushing to size — each grain forms in the electric furnace as a single, complete, multi-pointed crystal. The result is a wheel that's sharper — that cuts faster and cooler.

And the grains of 32 ALUNDUM abrasive are over 99% pure fused alumina — no non-cutting slag nor pores. This means greater resistance to dulling — fewer dressings, longer wheel life.

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ly Cut Your Grinding Costs!

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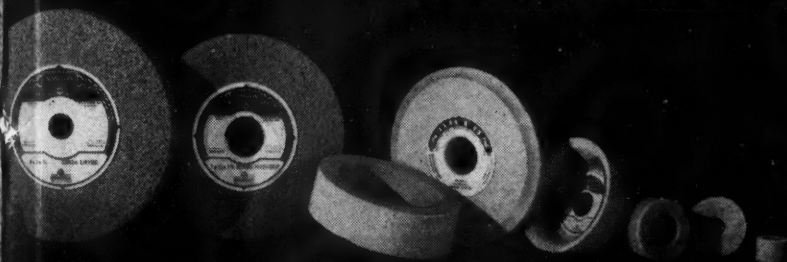
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*For Cooler Cutting*

*For Fewer Dressings*

*For Longer Wheel Life*



The cost-cutting ability of 32 ALUNDUM grinding wheels has now been definitely proved — by over a year of steadily increasing use in thousands of plants. They can cut costs for you, too. Try them for cylindrical, centerless, surface, gear, tool and internal grinding. Ask your Norton abrasive engineer or Norton distributor for specific recommendations.

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## IT TAKES SOMETHING EXTRA TO BE A *Specialist!*

It takes plenty of experience and the proper equipment to "land a big one"! It also requires technical skill and special machinery to produce high quality BATH ground thread taps!

Within our modern plant, precision equipment controls every important step of manufacture. Efficient machines have been designed by BATH to grind threads directly from the solid AFTER hardening, thereby avoiding any distortion. That's why our stock and special size BATH taps give extra wear . . . increased production!

Let us help you solve your tap problems . . . see your BATH representative or write direct.

(Transportation is paid to your plant on all Bath products)

# JOHN BATH CO.

INCORPORATED

20 Grafton Street  
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GROUND THREAD TAPS • PLUG AND RING THREAD TAPS • INTERNAL MICROMETERS

being started, the carriage conveys the work downward through the inductor block and into the spray quench. Rotation of the work is obtained during this operation by means of an electric motor and reduction gear which are mounted above the top of the machine spindle. Upon completion of all hardening operations the fixture automatically returns, at an accelerated rate, to the up position for unloading and reloading. The entire operation, between loading and unloading, is automatically controlled.

The  $\frac{1}{2}$ -inch diameter S.A.E. 1045 steel drive shaft is 23  $\frac{3}{8}$  inches long. Hardening is restricted to the gear spline sections at each end. The 12-tooth spline end is 3  $\frac{3}{8}$  inches long and the 6-tooth spline end is 1  $\frac{3}{8}$  inch long. Both ends are surface hardened to a depth of 0.040 inch, Rc 50-53 in 10.75 seconds. The hardening speed of the fixture is variable and the traversing speed is forty feet per minute.

The  $\frac{1}{2}$ -inch diameter S.A.E. 1045 steel propeller shaft is 5 inches long with a  $\frac{3}{8}$  inch threaded section on one end and a 1  $\frac{1}{8}$ -inch spline on the other end. Surface hardening is restricted to the 3  $\frac{3}{8}$ -inch center section and is accomplished in 7 seconds to a depth of 0.040 inch with an Rc hardness of 50-53.

This induction heating equipment enables the Champion Motors Company to obtain a production of 240 hardened drive shafts, or 360 propeller shafts per hour. Distortion, scale formation and decarburization are negligible.

### Stainless Steel Arc Welding Aids in Food Preparation

**T**HE housewife who purchases food today can be sure that the product is safe to eat — be it beans, soup or baby food—due to the great advances

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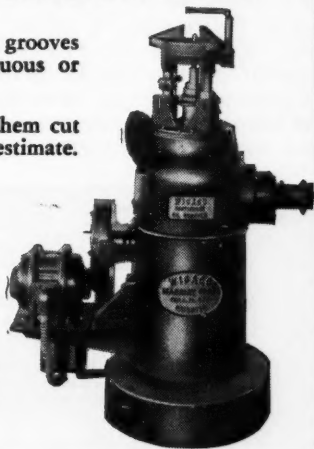
**WICACO**

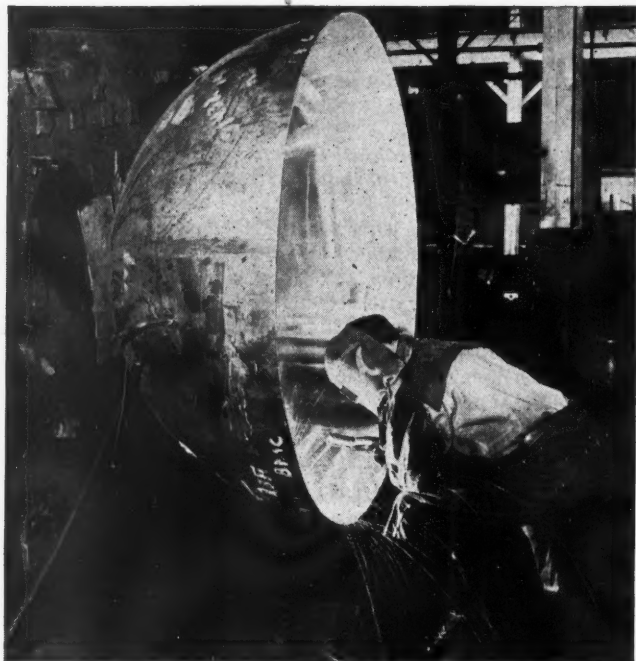
MACHINE CORPORATION

WAYNE JUNCTION, PHILA. 44, PA.

Manufacturers of  
Precision Machinery and Machine Parts

SINCE  
1868





The operator is shown arc welding the bottom section of a stainless steel soup kettle using Airco 19-9 electrodes.

known soup manufacturer.

Great care was taken in the selection of the right stainless steel and extensive tests were made, before the stainless steel electrode was picked for the job.

The reason for the tests and care taken in the choice of metals was that soup and other food products are pro-

duced under the most rigidly controlled, sanitary, bacteria-free conditions. Since the all-welded kettles were to be machined and polished, not only did the steel itself have to be highly resistant to bacteria and corrosion, but the welds had to be porosity-free and have a smooth, uniform appearance. This in itself was quite an advance over equipment formerly manu-

made in recent years in the manufacture of better steel and electrodes as well as the constant search made by food companies for higher standards in food preparation. A particular example of the research involved occurred recently when the Struthers-Wells Corporation, Warren, Pennsylvania, was called upon to fabricate stainless steel soup kettles for a nationally

## LUERS

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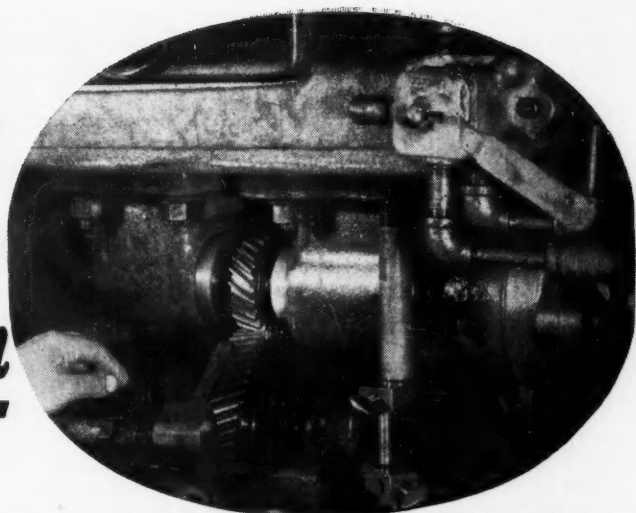
ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips — MEANS MAXIMUM CUTTING EFFICIENCY.

Manufactured by

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*News for  
the gear  
producer*



**Even faster GEAR SHAVING  
with LESS operator EFFORT**



Shaving of gears for accuracy and quietness is now so inexpensive and fast an operation on the new Michigan 870 machines that the only practical way to cut time and cost still further, is to cut the effort on the part of the operator.

This has been achieved by the provision of semi-automatic loading, now available on all Michigan Gear Finishing Machines.

In one plant, this development on a MICHIGAN "Underpass" finisher has increased production of timing gears from 920 per operator in 8 hours to 1684 !!

And the gears are "curved-shaved" (crowned) too, at the same time.

*For the story on this, ask for  
"Information Sheet No. 101-1113."*



Two operators easily shave 3368 gears in 8 hours on these four Michigan "Underpass" machines equipped with semi-automatic loading.

**MICHIGAN TOOL COMPANY**  
7171 E. McNICHOLS ROAD  
DETROIT 12, U. S. A.

factured which had joints, seams or rivets where it was possible for corrosion to set in and bacteria to collect with the consequent risk of food contamination and spoilage. Struthers-Wells decided that the results they wanted could be obtained with Allegheny-Ludlum stainless steel which is easy to form, weld and machine and with the Airco 19-9 stainless steel electrode which is marketed by Air Reduction Sales Company, New York, New York. The general chemical analysis of the Airco 19-9 electrode is chromium 19.0, nickel 9.0 and carbon 0.07.

The welds in the soup kettles were subjected to extensive tests prior to their use on a production basis, and showed the extremely low corrosion rate loss of 0.00075 inch per month in boiling nitric acid. Tests also showed a tensile strength of 85,000 lb. per square inch. The completed product was a kettle not only lustrous in ap-

pearance, strong, sanitary, unaffected by food or fruit acids and easy to keep clean but one which had welded seams, polished so smooth as to make it impossible for harmful bacteria to collect.

## Use of Rotab Simplifies Drilling Holes at a Compound Angle

**H**OW to bore a series of holes at a compound angle is in itself a problem, but when such a task must be performed in a heavy, unwieldy machine base, the problem is especially difficult. A Michigan manufacturer found an ingenious and accurate way to do the job, besides cutting the time required for drilling in half.

Faced with the task of boring twenty  $\frac{1}{2}$ -inch holes at a compound angle in a fabricated base measuring 42 in-

### MILLING



Above: No. 4 Motor Driven Milling Machine. Nos. 1, 2, 3, and 4 are specially suited for handling small, difficult work on a production basis.

# BURKE

### MACHINES

**FOR SMALL, DIFFICULT WORK ON A PRODUCTION BASIS . . . .**

#### GENERAL SPECIFICATIONS

Mach. No.	Working Surface of Table	Longitudinal Feed	Transverse Feed	Vertical Feed	Maximum Distance between center of spindle and table
1	3½x12	8	3¾	4½	5¼
2	3¾x16	6	2	4½	5
3	3½x12	8	3¾	7½	7½
4	3¾x16	8	3	8	8

Write **TODAY** for complete information, specifications, attachments not shown in above table.

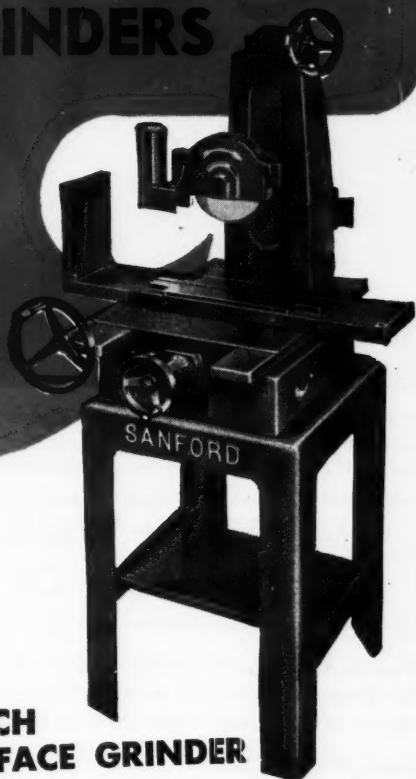
**BURKE MACHINE TOOL CO.**  
500 Sandusky St.                      Conneaut, Ohio



# SANFORD SURFACE GRINDERS

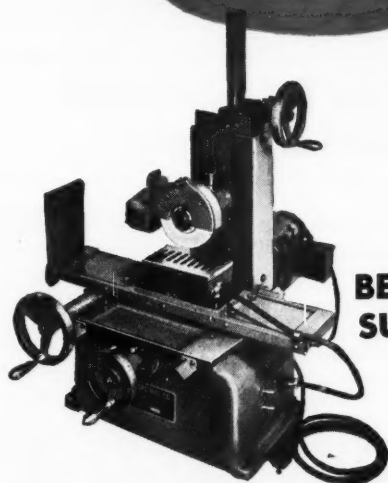
## Model MG

Handles many odd size tool room and production jobs, due to its capacity of 8" x 12" x 12". Actual movements — Transverse 8 $\frac{3}{4}$ " — Longitudinal 13" — Vertical 12" (under 7" wheel).



## BENCH SURFACE GRINDER

## Model SG



A sensitive, highly accurate machine specially designed "for the job that fits in your palm." Actual movements — Transverse 4" — Longitudinal 8" — Vertical 6" (under 4" wheel).

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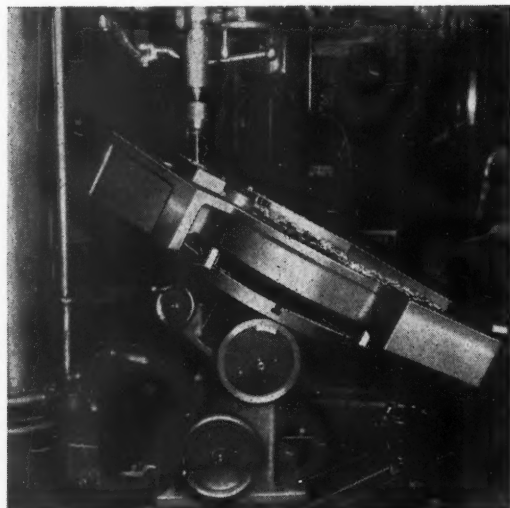


Illustration Showing Rotab Unit on which machine base is mounted for Drilling

24-inch Rotab which had been moved into position on a radial drill press. The setup for this job is shown in the accompanying illustration. The initial setup was made on the Rotab face plate which was then tilted to the proper angle. The workpiece was then indexed radially by means of a worm mechanism for drilling the various holes. The Rotab is a device manufactured by Machine Products Corp., Detroit, Michigan.

ches square and 8 inches in thickness and weighing 865 lbs., the manufacturer mounted the base on a standard

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## Machining Work Can Be Speeded By Means Of Sand Blasting!

**You remove hard scale, burnt sand and other hindrances to rapid work which also takes the edge off cutting tools all too quickly.**

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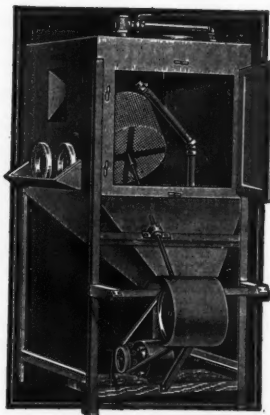
is purely a labor-saving process which merits close consideration from manufacturers, in all materials—metals, plastic, bakelite, glass, etc. MAT & SATIN FINISHES from fine silky effects to coarse frosty effects.

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A slight twist of the wrist and *click* the tool is solidly in place. A slight turn in the reverse direction—*click*—it's free and out.

It adequately fills a long felt want and efficiently overcomes practically all of the objections to straight Shank Tools. No knocking . . . no hammering into place . . . no shaking . . . no loose fitting.

The extreme rigidity of this new T. I. drive makes it ideal for interchangeable Carbide tip Counterbores and step Cutters.

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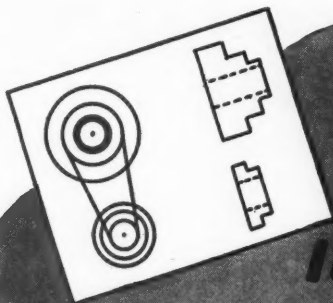
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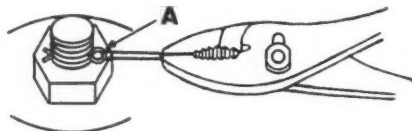


## IDEAS FROM READERS

### Hairpin Aids Removal of Cotter Pins

By A. H. WAYCHOFF

**A**LMOST every mechanic at one time or other has been faced with the problem of removing a cotter pin from the end of a shaft which is located in an almost inaccessible place on a piece of machinery. The method



Drawing Illustrating Method of Removing  
a Cotter Pin

of removing the cotter pin which is presented herewith offers a practical solution to the problem.

Essentially, the method involves the use of an ordinary hairpin or short piece of wire. The hairpin is looped through the eye of the cotter pin as shown at A. The ends of the hairpin are then pinched together and grasped between the jaws of a pair of pliers. A sharp pull on the hairpin will cause the cotter pin to be withdrawn from the hole in the shaft.

### Removing Broken-Off Studs

By W. E. WARNER

**S**TUDS which have been sheared off below the surface of the workpiece are difficult to remove, and while they may be successfully drilled out, the internal threads of the workpiece are usually damaged during the drilling operation to such an extent that the hole must be re-threaded to accommodate an oversize stud. Broken-off studs can be removed in several ways, however, I have found the methods described herewith to be the two which offer the greatest advantages. Both methods are simple to contrive as well as effective in use.

First, take an old drill that is approximately 25 per cent smaller in diameter than the stud and sharpen it so that it will cut in the reverse manner. Next, position this drill in an ordinary carpenter's brace which can be worked backwards and commence to drill the stud. As soon as the drill begins to "bite," the effect will be to loosen the grip on the threads and, after a few turns, the stud will be screwed out.

The second method of removing broken-off studs can be used if an oxy-acetylene torch is available. First, clean the top of the stud and then coat

# Five Times Faster than Lapping

## Say Users of **SUNNEN PRECISION HONING MACHINE**

Tool room users are enthusiastic about the speed with which they can precision finish internal diameters from .120" to 2.625". Many owners say the Sunnen Precision Honing Machine is as much as 10 times faster than hand lapping — and that accuracy and finish meet all their specifications. In addition, the overall cost of Sunnen Honing is much lower.

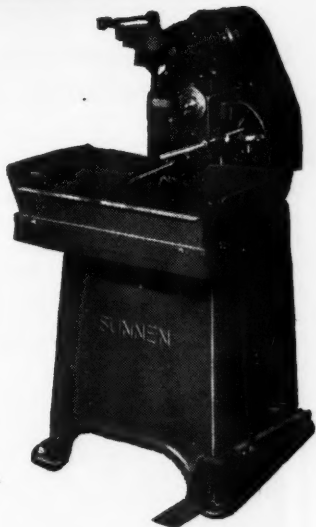
This machine is guaranteed to produce accuracy of .0001" and it is being used to hold tolerances within .000025" (25 millionths) in hardened steel. Finishes of 2 to 3 micro-inches can be produced.

Ideal for fitting dowel pins, ejector pins, die and jig bushings and for finishing ring gauges and extrusion dies.

### Sunnen Tool Room Honing . . .

- Increases life of parts
- Set up for any size hole in less than 1 minute
- Corrects heat treat distortion
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Write today for bulletin giving details—or we'll gladly send a Sunnen Engineer to your plant.



## SUNNEN PRODUCTS COMPANY

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### Typical Examples:

308



Shell Loading Die.



Hardened steel ring gauge—finished to an accuracy of .000025" for roundness and straightness.



Sunnen precision honing to a highly polished finish increases wearing quality of these hardened steel drill jig bushings.



Drawing and Blanking Die "saves time in producing smooth base metal finish."



Rubber Eraser Extrusion Die "tripled life of extrusion dies."

the threads and the surface at the top of the stud with a graphite paint. Place a nut centrally above the stud hole and by means of the oxy-acetylene torch proceed to bronze weld the top of the stud to the nut. After the nut has been welded to the stud, it will be possible to apply a wrench to the nut in order to unscrew the broken stud.

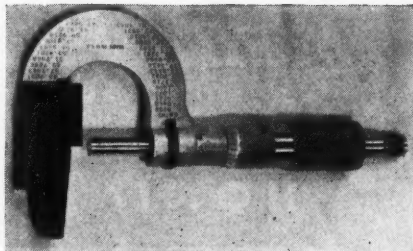


Fig. 1—Illustration showing modified micrometer for measuring tapered work.

## Modified Micrometer Facilitates Measuring Tapers

By D. E. McDONALD

**I**N the manufacture of machine parts which require odd tapers, and when I speak of odd tapers I am referring to such items as gibs, pins, and disks, it isn't always practical to take measurements across the large end of the work, and in many instances, the specifications and blueprints indicate

that the measurement should be taken across the small end.

If thousands of workpieces are to be made it is, of course, recognized that suitable gages can be economically constructed, but where the quantity of work is not large, and the dimensions cover a wide range, individual gages usually cannot be constructed without greatly increasing the selling price of the work.



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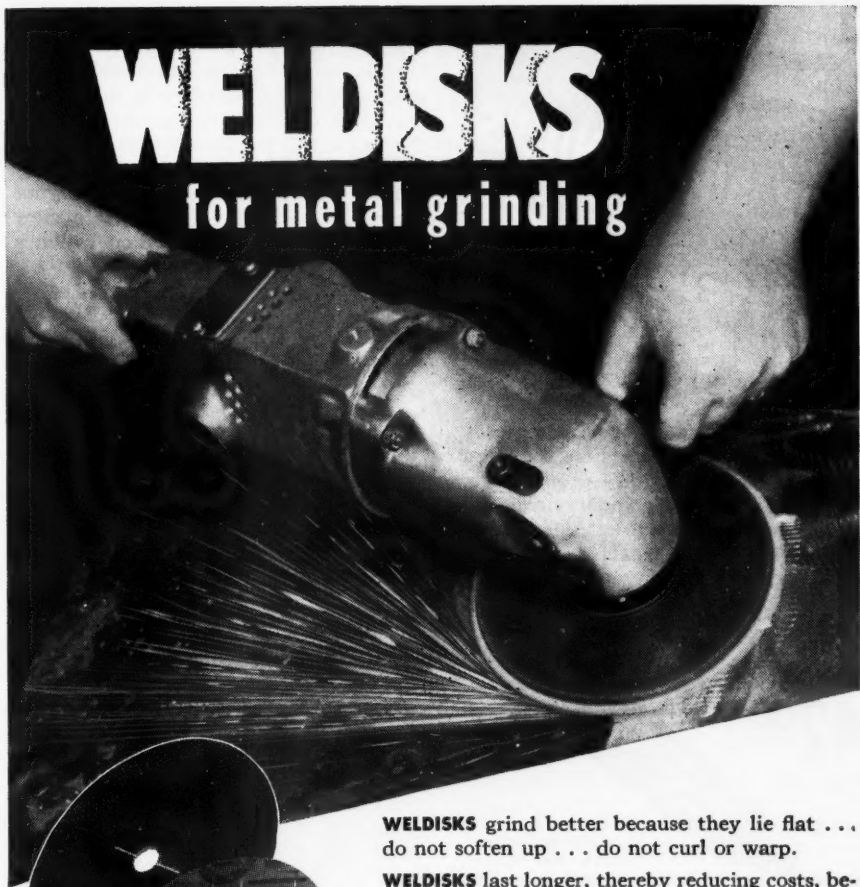
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for metal grinding



**WELDISKS** grind better because they lie flat . . . do not soften up . . . do not curl or warp.

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Weight 12 ounces;  
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I have found in the manufacture of many products as described above, that by adapting the conventional micrometer and modifying it in various ways, an inexpensive means of securing accurate measurements is available.

By referring to the accompanying illustration Fig. 1 you will see a view of a standard micrometer on which a

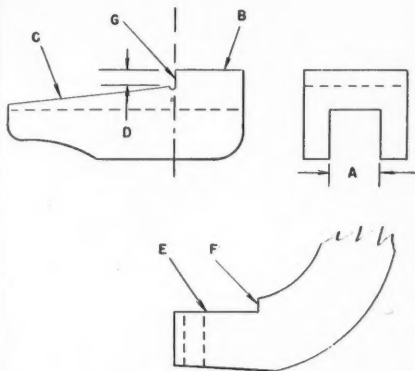


Fig. 2—Drawing showing shape of tapered anvil for modified micrometer.

tapered anvil has been substituted for the regular anvil in order to make possible the measuring of small ends of tapered work.

## General Construction

The drawing Fig. 2 illustrates the shape of a piece of tool steel which serves as the tapered anvil of the modified micrometer. This tapered anvil, after being machined, should be hardened and ground. At A is shown a rectangular groove which has been cut through the tapered anvil. This groove is machined so that it is just wide enough to snugly fit the sides of the micrometer frame. The depth of the groove, of course, depends upon the type of micrometer which is to be used, but in any event, the depth of the

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THAT HELP YOU**

*cut costs*



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● Simplified hand or foot control valves, and heavy duty air-pressure control accessories.

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groove must be deep enough so that sufficient material is left remaining on each side in order to secure the tapered anvil to the frame proper by the use of two small taper pins.

Prior to installing the tapered anvil onto the micrometer frame, the anvil in the micrometer frame must be removed, and the surface E as shown in Fig. 2 must be ground in order to produce a flat surface for the tapered anvil to rest on. Also you will note in Fig. 2, the shoulder F which enables the tapered anvil to be properly positioned onto the micrometer frame.

After the tapered anvil has been securely fastened to the micrometer frame, the frame is mounted in a vise and placed on a small grinder where surface B is ground at exactly right angle to the micrometer spindle. The vise is then tipped so that surface C can be ground according to the desired angle. When producing this surface, care must be taken so that the should-

er G is not disturbed, in order that when the tapered anvil is properly located this shoulder will be directly in line with the center of the micrometer spindle proper. After all surfaces have been ground it is next necessary to determine the height of shoulder D, and this amount must be ground off of the micrometer spindle in order to secure a direct accurate reading on the piece being measured.

## Handy Countersink for Deburring Drilled Holes

By LEONARD A. KROLL

**I**N order to simplify the task of removing the burrs which invariably are formed around the openings of holes during drilling operations, the small hand countersink shown in the accompanying illustration was devised. As shown in the illustration, the

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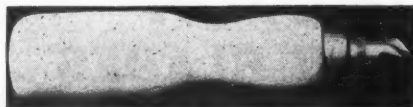
Get better hack saw service at a saving: Use Disston Hack Saw Blades.

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**HENRY DISSTON & SONS, INC., 621 Tacony, Philadelphia 35, Pa., U. S. A.**

*Canadian Factory: 2-20 Fraser Ave., Toronto 1, Ont.*

device consists of a wooden file handle into which an ordinary countersink has been tightly driven. This device has been found to be quite useful on



Handy Countersink for Deburring Drilled Holes

all small hole deburring operations, and particularly those which are encountered in tool-making and die work.

**Brown & Sharpe No. 743 Dial Test Indicator** with fine adjustment feature and magnetic base is depicted and described in a four-page two-color pocket-size folder published by the Brown & Sharpe Manufacturing Co., Providence 1, R. I. Copy free upon request.

**Hargrave Forged Steel Superclamps.** The Cincinnati Tool Co., Cincinnati, Ohio, now has available a six-page pocket-size folder presenting illustrated, descriptive, and tabular data on its line of Hargrave Forged Steel Superclamps, including regular service, deep reach, medium service, and heavy service Superclamps, as well as welders' clamp with anti-spatter screw. Copy free upon request.

**Carboloy Insert Tools.** A six-page supplement to its general Tool Catalog GT-200 and covering the company's expanded line of "insert" tools with mechanically held solid Carboloy cemented carbide bits has been released by the Carboloy Co., Inc., 11149 E. 8 Mile St., Detroit 32, Mich. The supplement covers not only the standard round, square, rectangular, and triangular bits available in various sizes but also shows the bit holders with their mechanical clamping devices and adjustment means. Also included in the supplement are grinding, set-up, and adjusting instructions for the complete line of Carboloy insert tools. Copy free upon request.

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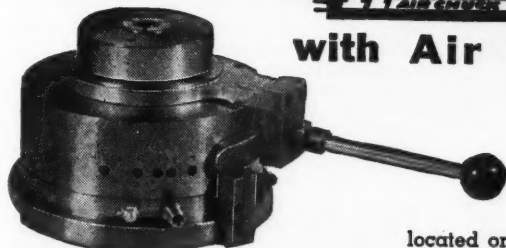
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# "Air Devices by Redmer"

## **Redmer** Index Chuck with Air Operated Collet



**RC-5**

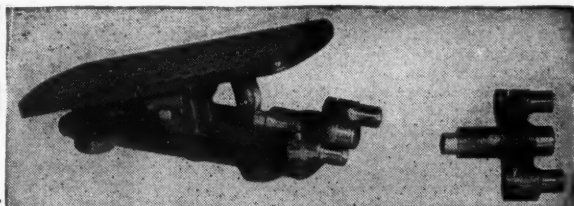
Eliminates removing chuck from base of machine for changing index position. Index screw posts

located on OUTSIDE of chuck. Provides positive alignment and depth control by using stationary type collets. Capacity 1/16" to 2".



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Designed to make its operation as tireless as possible. Opening and closing of plunger of valve on foot pedal is operated by a roller on pedal casting which relieves wear on plunger and facilitates operation. Valve is a brass casting which will take plenty of abuse and can be removed from the foot control and used as a separate unit in connection with cam operations.



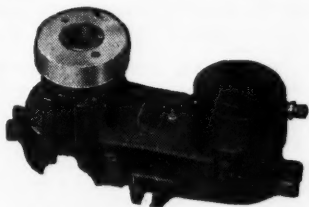
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## Collet Air Chuck

An air operated collet holding fixture using same type collets as Brown & Sharpe automatic screw machines. For drilling, milling, threading, etc., also for assembly work. Six models, No. 00, No. 10, No. 0, No. 2, No. 2 Special, No. 4, Collet Capacity 1/16" to 3 1/2". AVAILABLE WITH AIR EJECTION OR OIL FLUSHING.



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# News of the Industry

## Over-Aged Tools Called Handicap

The American metal-working industry is being handicapped by obsolescence of its machine tools, declared A. G. Bryant, president of the National Machine Tool Builders' Association, at the opening of the organization's spring meeting in Chicago. He cited as the reason for some of the industry's difficulties the fact that 90 per cent of the machine tools it uses are of pre-war design.

"The metal-working industry of America could, with the same manpower, increase output as much as 50 per cent if it were equipped with the latest models of machine tools," said Mr. Bryant.

He stated that there are three principal reasons for the inertia which delays needed rehabilitation.

"First is the lack of understanding of the value of the up-to-the-minute machine tools by the 'front office' of industry," he said.

"Second is the difficulty placed in the path of business by the interpretation under the tax laws of the regulations governing depreciation. The solution is to give industry freedom of choice to permit a concern to depreciate a new machine over five years, if it so elects, so that it can absorb such charges realistically during the time that the machine pays for itself.

"Third is the contraction of venture capital available for capital expenditure. Regulations which require corporations to distribute a large share of current earnings in dividends to stockholders, when the funds so paid out may be needed for rehabilitation or for necessary reserves, ignore the precepts of good management."

Mr. Bryant said that machine tools today average in sales price only about 50 per cent above the 1939 level. "Compare this with the increase in labor rates of over 106 per cent, with the increase in farm income of more than 200 per cent, and with the increase in wholesale commodity prices of 111 per cent," he added.

The association president urged the 500 executives attending the meeting to ask "that Government have an active realization of the place that machine tools

have in the sound development of our European Recovery Program, not only to the benefit of rehabilitation in the needy countries, but as a means of conserving American dollars and alleviating shortages of American goods."

## Super-Speed X-Ray Photographs Aid Studies of Industrial Machines

Millionth-of-a-second X-ray pictures, which were used during the war in ballistic studies, now are being applied to solve many peacetime problems of industry and aviation, Dr. Charles M. Slack, research director of the Westinghouse Lamp Division, Bloomfield, N. J., told The American Society of Mechanical Engineers in an address to the photographic group of the Metropolitan Section, at the Engineering Societies Bldg., 29 W. 39th St., New York City. Studies never before possible have been made of fast-moving machine parts, and of the bodily distortions of fliers in simulated crash landings, he said.

This X-ray "eye" makes an exposure 20,000 times as fast as a routine medical X-ray machine, Dr. Slack reported. It was made possible by the development of a special electronic tube operating under high momentary voltage. The tube was developed by Dr. Slack and his associates in the Westinghouse Laboratories some seven years ago.

"There is no machine part which moves too swiftly to elude it," Dr. Slack said in describing the industrial studies now under way. When the voltage is applied, electrons speed at approximately 100,000 miles a second in their flight from the tube filament to the anode "target," pouring an X-ray barrage through metal to make the picture.

### Unit Used for Atomic Bomb Study

During the war, millionth-of-a-second X-ray photography was used in connection with the atomic bomb, and for studies of shells, bullets and armor plate. Arsenal and proving grounds in this country and Great Britain were thus able to add new knowledge to the science of ballistics, Dr. Slack told the engineers.

# Introducing a new **SMALL SIZE**

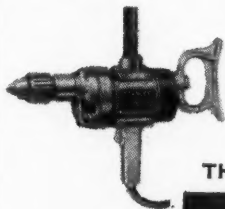
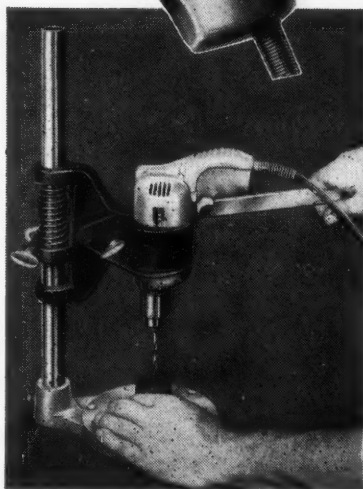
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It's a fist-ful of power . . . for drilling metal, wood or composition materials. Light enough to swing easily overhead or horizontally at arm's length. Compact enough for close-quarter work. Made the way Stanley makes all tools . . . sturdy, for years of useful life. Capacity,  $\frac{1}{4}$ "; length  $8\frac{1}{4}$ "; weight,  $3\frac{1}{4}$  lbs.

**Economical drill press . . .** Locked in the Stanley Drill Stand No. 514, the No. 24 doubles its utility . . . becomes an efficient drill press for a variety of light drilling jobs.



Stanley Electric Drills come in a full range of sizes for wood or metal drilling. Available from Stanley distributors. Write for descriptive literature. Stanley Electric Tools, 520 Myrtle Street, New Britain, Conn.

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It was learned that a high explosive shell inflates to twice its normal diameter before it appears to burst open inside a steel plate. The blast which accompanies the firing of a rifle bullet, the photographs disclosed, sometimes will reach the muzzle ahead of the bullet. Ultra-speed X-raying was described as the only adequate method of determining how a bullet or shell behaves as it hurtles down the bore of a gun or strikes its target.

### Research Project of Engineering Foundation To Study Welding Problems

The accelerated use of welding during the war accentuated unsolved problems in the design, fabrication and industrial use of all kinds of welded structures. Investigations sponsored by the Welding Research Council, a project of the Engineering Foundation, 29 West 39th Street, New York, will be directed toward helping to solve these problems, according to Dr. A. B. Kinzel, chairman of the Foundation's board.

Long-term research includes studies of

weldability, structural steel, weld stresses, resistance welding, and pressure vessels. Studies refer to materials used for bridges, buildings, ships, airplanes, locomotives, railroad cars, automobiles, machinery and refrigerators.

Research in weldability is being conducted at Lehigh University, Rensselaer Polytechnic Institute, Battelle Memorial Institute, the University of California, Los Angeles, and Massachusetts Institute of Technology. It will aim to evaluate the ductility of various metals as influenced by the welding process. Studies are also being made into the factors under which various metals become brittle, so that practical information will be readily available to designers, especially of welded joints for buildings, bridges, tanks and ships.

Projects on structural steel were initiated at the suggestion of practicing engineers, to provide information needed by them in writing specifications for materials and in designing welded structures more rationally and more economically. Static load tests of heavy box girders are being made at the National Bureau of Standards to determine load capacity, energy absorption and general behavior of steel at various temperatures.



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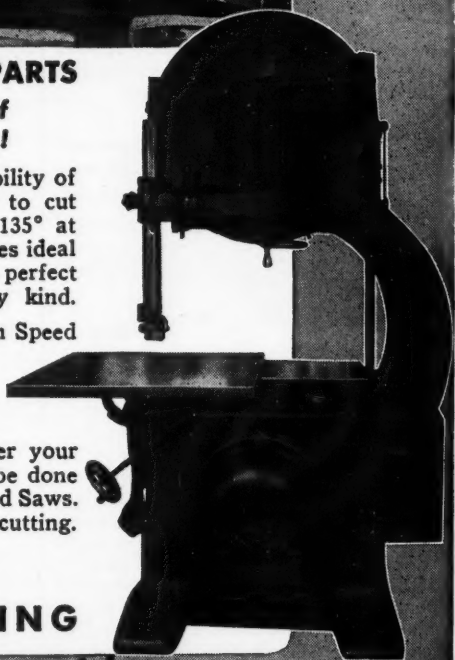
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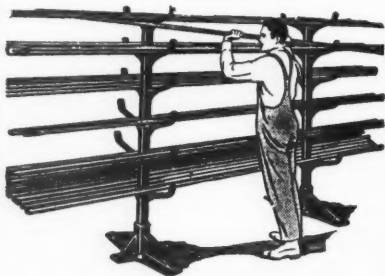
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Each BROWN SECTIONAL RACK combines five major and several minor features of design, all of which save money for its owner. The time previously lost in end-hauling each bar of stock its entire length from the old-style, closed-side Rack is saved by the Brown Rack which requires but a few inches of side movement.



Each length, width and thickness of stock is displayed in Gold-Fish visibility for instant selection and workmen waiting for stock are served without waste of time. The BROWN SECTIONAL RACK is a simple, durable article built in five styles from standard inter-locking metal sections. It cannot burn, sag or twist; unattached to the building, it can be moved at will. Changes in length of stock can be met by moving the units nearer or further apart, while increases of stock can be met by simply adding more standard units. Built from metal thruout, depreciation is practically nil. SEND FOR BULLETIN 26-M.

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At Columbia University research workers have finished tests to learn whether residual stresses due to welding could combine with load stresses to cause premature failure under impact, before there was time for stress peaks to be ironed out by plastic deformation. With these tests as a guide, an investigation is now being made of the behavior of various kinds of structural carbon-steel materials in plain or welded steel beams at various temperatures, including low winter temperature.

At M. I. T. a study is being made of the stability of welded compression elements, with the idea of obtaining basic data which can be used in codes to specify optimum and minimum spacings for lengths of welds and proportions of welded elements, in order to insure stability of the structure.

In an effort to evaluate the true load capacity of steel frames and members an analysis is being made at Lehigh of the plastic as well as the elastic behavior of beams, columns and connections in rigid frames.

An investigation of the effects of peening will be carried out at the American Bureau of Shipping Research Laboratories. Its purpose will be to establish or disprove the necessity for certain peening requirements, such as elimination of peening of the last layer, in welding codes applicable to field erected structures like tanks, bridges and ships.

Aspects of resistance welding are being investigated at Rensselaer, Johns Hopkins and Ecole Polytechnique, Montreal. Studies include projection welding, contact resistance and fatigue strength, and spot welding of mild steel aimed at establishing optimum welding conditions for heavier gages of this steel.

Pressure vessel research carried on at Purdue and Lehigh Universities, is designed to develop information and data which will lead to better, safer and more economically constructed pressure vessels and boiler drums.

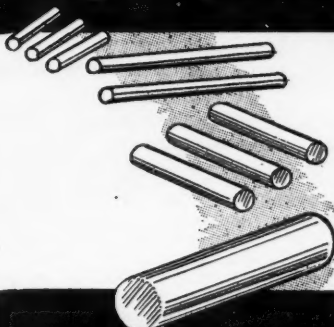
### Change in Plant Location

The Midwest Tool & Mfg. Company, producer of metal cutting tools and other products in Detroit, Michigan, since 1911, has removed its plant, manufacturing facilities, and executive offices to Upper Sandusky, Ohio.

According to Geo. E. Sheldrick, Jr., vice president of the company, the new plant is of modern, one-floor construction, provides almost twice as much operating floor space as the former plant,



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This newest member of the DI-ACRO family of "DIE-LESS DUPLICATING" Machines brings you accuracy, speed, capacity range and ease of operation fully up to the standards established by DI-ACRO Precision Benders, Brakes, Shears.

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and has been equipped with additional machinery and facilities for increasing the production of metal cutting tools. Provisions have also been made for the manufacture of other related lines.

Direct, company operated branch offices are being retained in Detroit at 2360 West Jefferson Avenue, and in Chicago at 549 West Washington Boulevard.

### Opens New Administration Building

The Independent Pneumatic Tool Company, manufacturer of Thor portable power tools, announces the opening of a new administration building adjacent to its main works at Aurora, Illinois. The building, constructed and equipped at a cost of \$1,500,000, will accommodate Thor's entire executive and administrative staff, the major portion of which was transferred to Aurora from Chicago for consolidation with other office divisions previously located within the Aurora works. The company's Chicago sales branch will retain temporary headquarters at the former general office address, 600 West Jackson Boulevard, until construction of a new branch office building

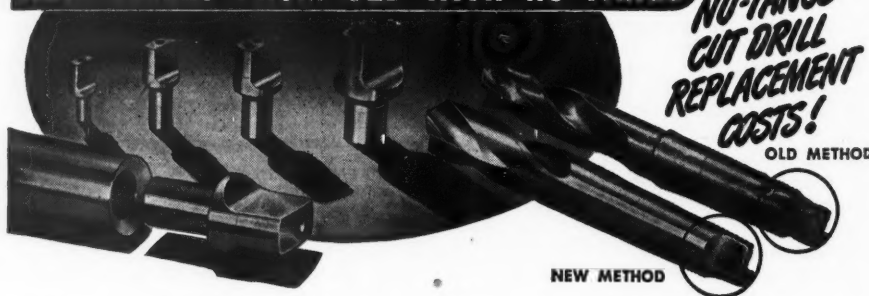
is completed sometime in the fall.

The new administration building provides office space involving an area of 40,000 square feet on two floors and additional space for machine shop, factory, and steel storage of 35,000 square feet. Completely modern in design, construction and furnishings throughout, the building is equipped for air conditioning, radiant type heating and latest type lighting. A bridge for employee's use spanning the courtway between the new office building and the existing buildings on the north forms a convenient connection between the two structures. A similar connection at grade is provided between the new plant and the present manufacturing space on the north.

### Secretary of Commerce Bestows an A.T.A.E. Award on Industrial Diamond Ass'n. of America

Public attention again has been drawn to the industrial diamond. This time, it is for the service of its trade association to industry and government in peace, without regard to the diamond's wartime prestige, when this modern tool worked

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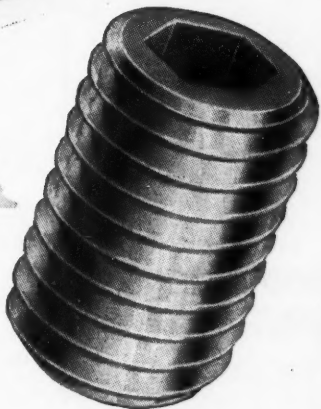
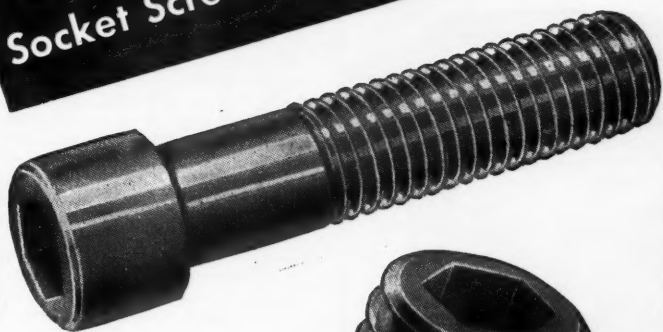
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miracles in precision war production and also in the exploration for scarce minerals and metals.

The Industrial Diamond Association of America, Inc., is composed of importers of diamonds and manufacturers of diamond tools. The entry in the contest for the much prized awards of the American Trade Association Executives for Distinguished Service was prepared by the diamond group's Executive Manager, Athos D. Leveridge, to whom Secretary Harriman presented a certificate at the A.T.A.E.'s Spring Meeting luncheon in the Hotel Statler, Washington. The entry consisted of a brochure titled "Our Association and its service to its Members, to Industry and Government." The problems confronting the industry, the need for organizing the difficulties in the way and how they were solved, were set forth. The association's activities in membership cooperation, trade fellowship, cooperation with government, research, public relations, good trade practices and its international aspects were reviewed and the brochure was illustrated with photographs of substantiating letters, and news clippings, and supplemented with copies of technical publications sponsored by I.D.A. and of its periodical Member Letter.

The President of the Industrial Diamond Association is Stephen W. Hofman, Vice Pres. of Diamond Distributor Sales Co., New York; Vice Presidents, Charles J. Koebel, Detroit, and Walter J. Meinhardt, Chicago. Directors are: I. R. Berk, Chicago; O. Ferrier, Ft. Wayne; F. E. Koebel, New York; I. J. Meade, New York; J. A. Ross, Scranton; L. Small, Ferndale; D. Van Itallie, New York; and H. B. Wallace, Detroit.

## James Y. Scott Named Special Emissary

James Y. Scott, president of Van Norman Company, Springfield, Mass., and president of the Morse Twist Drill Company, New Bedford, Mass., has been named special emissary by the American Society of Tool Engineers at the Institution of Production Engineers in England.

Scott will attend a meeting of the British organization at Wolverhampton, England, May 28, where he will present to the president of the institution an honorary life membership in the American Society of Tool Engineers. The ASTE president holds a similar membership in the British IPE. Each organization is



**ECONOMY Lubricant 1888  
fluid type - water soluble  
For Grinding and Cutting**

***Rapid stock removal—  
fast chip settling—non-irritating  
to nose, throat or skin***

**THE WHITE & BAGLEY COMPANY**  
**WORCESTER, MASS. • DETROIT, MICH.**

*Originators of Grinding Lubricants*

considered the counterpart of the other in its respective country.

The newly-appointed ASTE emissary will leave New York by plane May 10 and will spend some time in England, Scotland, and Ireland visiting British plants and making a survey of production methods abroad.

### 150,000 Employers Have Apprentice Programs

The number of employers who have registered apprenticeship programs totaled approximately 150,000 at the end of March to set another all-time record, according to an announcement made by the Bureau of Apprenticeship, U. S. Department of Labor. This represents a gain of 62,500 over the 87,500 listed at the end of March 1947.

Registered programs are those approved by a State apprenticeship agency, or, where none exists, by the Federal Committee on Apprenticeship. This committee is the national management-labor policy body for the Bureau of Apprenticeship which provides technical advisory service to industry in setting up and maintaining apprenticeship programs.

The establishments with registered programs range from large railroad systems, manufacturing companies, newspapers, shipyards, private and publicly owned utilities, and municipalities to small contractors, machine and various types of repair shops.

The number of joint management-labor programs also set a new record at the end of March with 5,989. Ohio led in this category with 693. The other states in the first ten were: California, 683; Pennsylvania, 539; Illinois, 364; New York, 300; Wisconsin, 260; Michigan, 242; Indiana, 239; Arizona, 193; and Washington, 186. These include programs in which a number of employers are participating and those set up for an individual plant or shop.

### Wilson P. Hunt

Wilson P. Hunt, co-founder of the Moline Tool Company, passed away at his home on Sunday, April 4, 1948. Born on January 22, 1873 at Moline. Mr. Hunt started work on August 15, 1890 as an apprentice at William-White & Company where he learned the machinist's trade. From there he went to Deere & Mansur Works, where he was employed in the

## "SCHULTES" ... The King of Motor Drives!



Unit Shown on  
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ALL HELICAL GEARED,  
UNSURPASSED IN POWER,  
EFFICIENCY, SAFETY  
AND COMPACTNESS

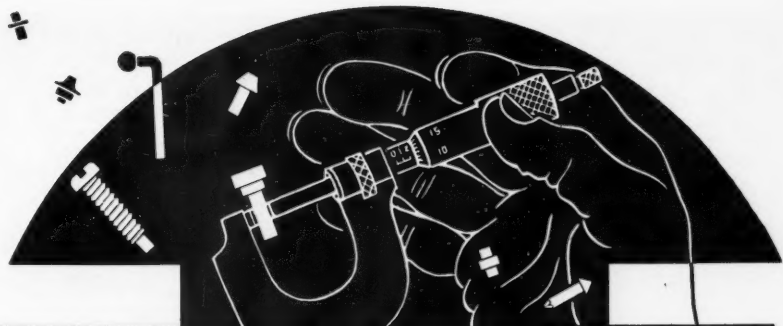
Write for Complete Detailed Specifications

17403 GABLE  
AVENUE

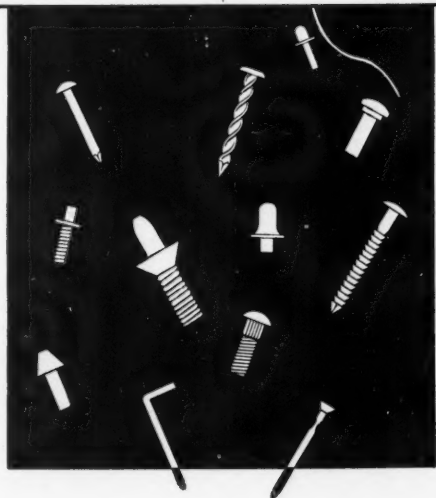
*Schultes Level*  
INCORPORATED

DETROIT 12  
MICHIGAN



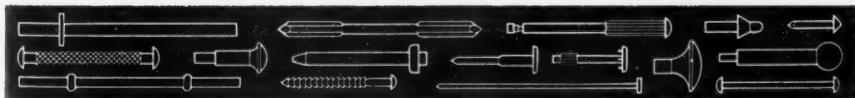


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**HASSALL** Cold-heading may solve your immediate special part problem . . . Special nails, rivets and threaded parts made in diameters from  $1/32''$  to  $3/8''$ —lengths up to  $7''$  . . . Rivets  $3/32''$  diameter and smaller a specialty . . . Variety of metals, finishes and secondary operations . . . Economy, quality and quick delivery in large or small quantities . . . Tell us what you need . . . We will answer promptly. **ASK FOR FREE CATALOG.** 3-color Decimal Equivalents Wall Chart free on request.

**JOHN HASSALL, INC. • 394 OAKLAND STREET, BROOKLYN 22, N. Y.**



experimental department. In March 1901 Mr. Hunt, together with George Ahrens, organized the Moline Tool Company and he served as president and general manager of the company until 1926. Thereafter he acted as consulting engineer and held the office of vice president until his death.

Mr. Hunt was always very active in religious and philanthropic work. He was a member of Doric Lodge of Masons, Moline Consistory, The Rotary Club, and was a former director of the National Machine Tool Builders' Association.

### David Findlay Passes

David Findlay, former president of The L. S. Starrett Co., Athol, Mass., died on April 3. Mr. Findlay was actively associated with Starrett for 55 years, starting on the road in 1891 assisting the founder, Laroy S. Starrett, in pioneering Starrett tools with both the trade and the shops.

At the turn of the century, Mr. Findlay was appointed general sales manager and later became a director, vice president, and eventually president of the company. He retired early in 1946, being succeeded by the present president of the company, Arthur H. Starrett.

### George Squibb Joins Detroit Broach

George Squibb, who for the past fifteen years has served as broach development engineer with the Cincinnati Milling Machine Co., Cincinnati, has joined the Detroit Broach Co., Detroit, Mich., in the capacity of chief engineer.

Mr. Squibb is a graduate of the University of Michigan where he completed courses in mechanical and aeronautical engineering. He has contributed many articles on the subject of broaching to the various engineering magazines and over a period of years has lectured before approximately twenty engineering groups and societies on the subject of broaching and its applications.



George Squibb

*Specials!*

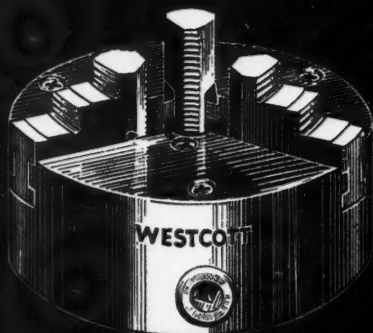
**CIRCULAR AND FLAT  
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BAR MACHINES**

Stites' Personalized Screw Machine Tool Service for Cams and Tools has now been broadened to include the manufacture of circular and flat form tools for all bar machines. Combined know-how and accuracy built into every tool.

Circular and flat form tools illustrated typify our diversified engineering and manufacturing facilities for Acme, Cleveland, Davenport, Brown & Sharpe No. 00 and No. 6, and Warner & Swasey Machines. Deliveries to meet individual customer requirements.

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*Precision Craftsmanship*

PRECISION MANUFACTURING SINCE 1872

WESTCOTT CHUCK COMPANY

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PRECISION    DEPENDABILITY    SERVICE



## Did You Know?---

The Reed Rolled Thread Die Co., 237 Chandler St., Worcester 2, Mass., has appointed **Fred E. Duerre** of the Production Tool Sales Company as its representative in Northern New Jersey, with office located at 2 North Dean Street, Englewood, New Jersey.

Leicester S. Lewis, vice president and sales manager of The Tabor Manufacturing Co., 6225 Tacony St., Philadelphia 35, Pa., has announced the appointment of **Snow & Gagliana**, 533 Second St., San Francisco 7, Calif., as Tabor's new representative in the State of California north of Fresno.

According to an announcement made by **Wayne Sinclair**, president, **W. S. Austin**, sales manager of the LeMaire Tool & Manufacturing Co., Dearborn, Mich., has been elected vice president but will continue to serve as sales manager.

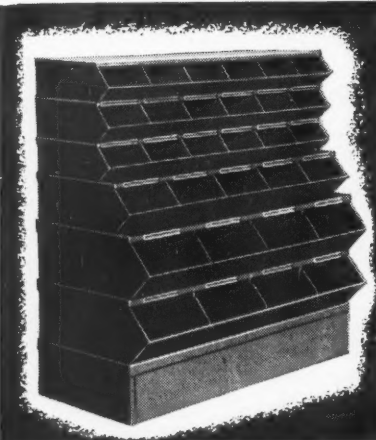
**Robert L. Ledbetter** has been appointed sales representative in Texas and Oklahoma for the Buckeye Tool Corp., Dayton, Ohio, manufacturer of pneumatic and electric portable power tools, according to an announcement by **H. O. Gummere**, vice president of the firm.

**Clinton E. Stryker**, formerly president of Adel Precision Products Corporation and Aerco Corp., Burbank, Calif., has been elected president of Maysteel Products, Inc., manufacturer of benches, stands, and cabinets for small lathes and other machine tools.

Beginning May 1, 1948, the Screw Machine Tool portion of **Fred C. Paatsch** Company of Milwaukee, Wisconsin, will operate under the name of **Screw Machine Tool & Supply Company**, a division of **Fred C. Paatsch Company** devoted to serving the screw machine industry.

**James E. Mossell**, manager of the Machine Tool Division, Buffalo Forge Company, has announced the appointment of the **Eccles-Germain Machinery Co.**, 1910 Santa Fe Ave., Los Angeles, Calif., as distributor in the Los Angeles area for the Buffalo Forge line of punches, shears, bar-cutter and bending rolls, and the larger power drills.

The appointment of the recently formed **Tool Sales Co.**, 224 E. 38th St., New York 16, N. Y., as its new representative in the southeastern part of New York State has been announced by **Scully-Jones & Co.**, Chicago, Ill., manufacturer of standard and special production tools.



## Auxiliary Stockrooms

— Wherever You Need Them!

STACKBIN sections will give you a stockroom wherever you want it—quickly and easily as building a sectional bookcase. These patented sectional storage bins nest together without the use of tools—cost you nothing to build, nothing to move. Find out today how STACKBINS can lower handling costs.

*Manufactured and sold in Canada exclusively by Wickware-Stackbin, Ltd., Ottawa*

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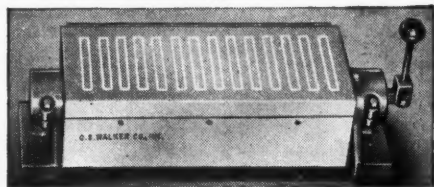


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Still Accessible"

# Hold Everything! with Walker Chucks

Save Time—Save Costs—Promote Accuracy.  
Walker PERMANENT MAGNETIC CHUCKS  
give you more holding power . . . more magnetic  
area. . . . No wiring—these chucks are energized by  
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nitely*. Whatever your holding problem Walker has the  
*modern* answer. Hold everything with Walker Chucks.  
Sizes, Rectangular and Swivel—4" x 8", 5" x 10",  
6" x 12", 6" x 18", 8" x 24". Also 8"—12" Rotary and  
same sizes in Swivel design.



Protected by Walker patents.

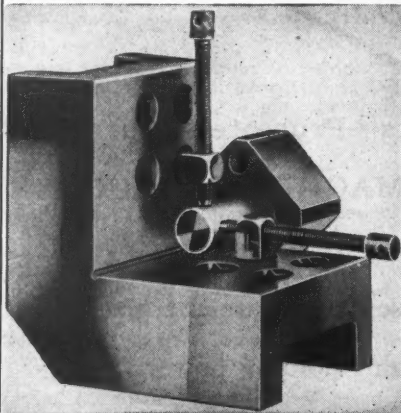
## O. S. WALKER CO. Inc.

WORCESTER 6, MASSACHUSETTS

*Original Designers and Builders of Magnetic Chucks*

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## CLAMPING BLOCKS



Save costly set-ups in holding small work. All surfaces ground square with their opposite and right angle faces . . . to assure a perfect job on removal from block. Square sliding clamps are fitted to broached holes for easy removal. Furnished with two long and two short sliding clamps. Screws have knurled heads with hex broached hole in end for wrench tightening. Blocks furnished hard or soft . . . Model H-4 or S-4.

**Write for folder.**

*Also manufacturers of Drilling Plates  
and Radius Emery Wheel Dressers.*

**TALLMAN TOOL  
& MACHINE CORP.**

ROCHESTER

• NEW YORK

### Did You Know?---

**Kearney & Trecker Corp.**, Milwaukee, Wis., builder of precision and production machine tools for milling and boring, celebrated its Golden Anniversary May 17, 1948, a suitable program and open house for employees and their families, commemorating the occasion, being held Sunday, May 16.

**The Billings & Spencer Co.**, Hartford, Conn., manufacturer of drop forged wrenches, shop tools, and drop forged parts for industrial and commercial use, has appointed **Worden W. Gentino** as its representative in the Chicago territory, with headquarters in the company's office in Chicago at 549 West Washington Boulevard.

**A. B. Vestal**, who graduated from Carnegie Tech in metallurgical engineering and for the past 8 years served as head of industrial engineering at both the Farrell and Duquesne plants of Carnegie Illinois Steel Corporation, has been appointed to the management's staff by the Fifth Sterling Steel & Carbide Corporation, McKeesport, Pennsylvania.

At its annual meeting on April 20, John H. Graham & Co. Inc., 105 Duane St., New York 8, N. Y., re-elected the following officers: **Harold S. Graham**, president; **George W. Eckhardt**, vice president; **George A. Graham**, secretary; and **M. A. Nixon**, assistant secretary. **S. L. Goldsmith**, who has been a member of the organization for the past 10 years, was elected treasurer of the company.

Associated with the firm since 1902, **William F. Ross**, 63, vice president and a director of The Standard Tool Co., 6918 Central Ave., Cleveland, Ohio, died suddenly at his home in suburban Rocky River on April 21.

**Scully-Jones and Co.**, Chicago, Ill., manufacturer of standard and special production tools, has announced a change of representation in the northern part of New Jersey and the appointment of the recently formed **Production Tool Sales Co.**, 2 N. Dean St., Englewood, N. J., as its new sales representative in this territory.

**Allen W. Lovell**, who joined the Modern Collet & Machine Co., Ecorse, Mich., as sales manager in 1944 and was appointed general manager in 1946, was recently elected vice president of that company.



GUARANTEED WATERPROOF  
FOR WET OR DRY GRINDING  
•  
MAXIMUM HOLDING POWER  
•  
LONG LIFE CONSTRUCTION  
•  
FOR OPERATION ON  
110 OR 220-VOLT D.C.

# L-W MAGNETIC CHUCKS

5 1/4" x 13"

**\$47.65**

6 1/2" x 18"

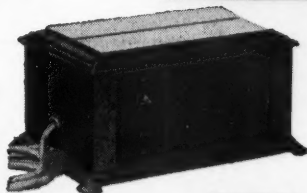
**\$63.15**

8" x 24"

**\$109.30**

10 1/4" x 37"

**\$202.05**



## RECTIFIERS

For converting A.C. into D.C. for use on magnetic chucks. A.C. input 110 volts. D.C. output 110 volts. For continuous duty and long life. P-1 for 5 1/4" x 13" chuck 0.8 amps., **\$35.75**. P-2 for 6 1/2" x 18" chuck 1.0 amps., **\$45.00**. P-3 for 8" x 24", 10 1/4" x 37" chuck 3.0 amps. **\$60.00**.



## DEMAGNETIZERS

A single pass over the stationary poles is sufficient to completely demagnetize work that has become magnetized through induction. Model B-2 for large work, complete with pilot light signal, switch and cord. Operates on 110 volts A.C. current. 7 1/2" wide, 12 1/2" long, 6 1/2" high. Shipping weight 35 lbs. . . **\$63.20**

Model J-1 for small work, complete with switch and cord. 7 1/4" wide, 7 1/4" long, 6 1/2" high. Shipping weight 35 lbs. **\$41.15**

## DEMAGNETIZING SWITCHES

For use on our 5 1/4" x 13" and 6 1/2" x 18" sizes. When the switch is thrown to "ON" position, the chuck is magnetized, and the work held firmly for grinding. When the work is to be released, the switch is thrown to "DEMO" and contacts are touched momentarily to neutralize the chuck. **\$8.90**



Field discharge type for 8" x 24" and 10 1/4" x 37" **\$16.25**

Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



# L-W CHUCK COMPANY

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## Did You Know?---

Allan E. Goodhue, vice president and director of the Chicago Pneumatic Tool Co., 6 E. 44th St., New York 17, N. Y., died April 20 after a short illness.

Directors of **The Monarch Machine Tool Company**, at a recent meeting, unanimously approved the establishment of a fund of \$30,000 from which over the next five years 15 scholarships of \$2,000 each will be awarded, three each year, to boys graduating from Shelby County schools with high scholastic records and ambitions to pursue the study of mechanical or electrical engineering at a leading college or university, whether in Ohio or elsewhere in the country.

Purchase of the manufacturing assets and patent interests of the Nelson Stud Welding Corp., Lorain, Ohio, and its associated companies, developers in the stud welding field, by the recently-formed **Morton-Gregory Corporation** of Detroit, Michigan, has been announced by Henry J. Morton, president, and George E. Gregory, vice president and general manager of the new firm.

**E. C. Lanno**, formerly of the Detroit Diesel Engine Division of General Motors Corporation, has been named development engineer of the Rockford Clutch Division of Borg-Warner Corporation, according to an announcement by Arch A. Warner, president of the Rockford Clutch Division.

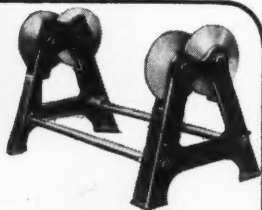
**Fred J. Heid**, formerly vice president in charge of sales of the Verson Allsteel Press Company of Chicago, has been appointed general sales manager of Ekstrom, Carlson & Co., Rockford, Ill., manufacturer of high production metal-working machinery, to replace **S. P. Ekstrom**, former president and sales manager, who has been appointed chairman of the board of directors.

At the annual meeting of stockholders, the name of **The American Rolling Mill Company**, Middletown, Ohio, was officially changed to **Armco Steel Corporation**, according to an announcement by Charles R. Hook, president.

The incorporation of the former **Pannier Brothers Stamp Co.**, 207-209 Sandusky St., Pittsburgh 12, Pa., under the new name of **The Pannier Corporation** was recently announced by the company management.

## SELECT THE BEST...

### Balancing Tool for Your Work from Sundstrand's Complete Line



Here's a complete line of Balancing Tools which will save their cost quickly on balancing or truing operations. Accurately sensitive and durable, they provide a simple, reliable means for checking the balance of parts like gears, shafts, fly wheels, pulleys, etc. The standard sizes available are shown in capacity chart at right.

#### CAPACITIES

Swing	Between Standards	Weight Capacity
21 in.	20 in.	12 lbs.
21 in.	20 in.	800 lbs.
43 in.	29 in.	800 lbs.
43 in.	29 in.	2,000 lbs.
6 ft.	5 ft.	5,000 lbs.
8 ft.	8 ft.	10,000 lbs.
Any	Any	24,000 lbs.
43 in.	30 in.	800 lbs.



#### FREE ADDITIONAL DATA

You can obtain complete information on Sundstrand Balancing Tools by writing for bulletin No. 573.



**SUNDSTRAND  
MACHINE TOOL COMPANY**  
2539 Eleventh St. Rockford, Ill., U.S.A.

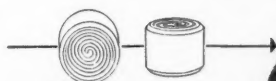
POWER  
TOUGHNESS  
PROTECTION  
BALANCE

LONG LIFE  
DURABILITY

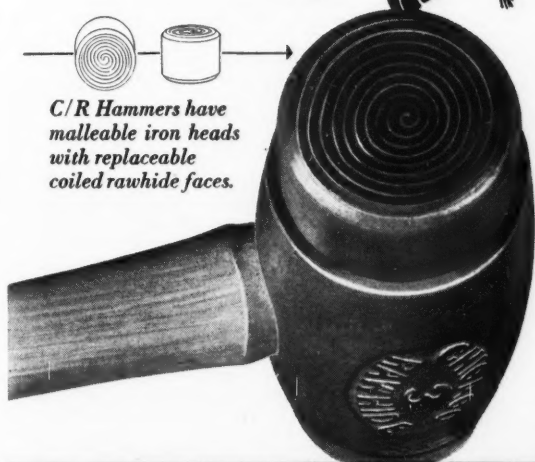


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... that's the material which gives you *everything* you want in top grade "soft" hammers and mallets. And *Chicago* means the best in Rawhide. C/R mallets and hammers are made from resilient, tightly coiled, rawhide. They absorb shock, deliver powerful blows yet protect delicate machinery and surfaces, and stand up under continuous hard use. They do not split, crumble, or mushroom. For durability, power and safety, always specify *Chicago Rawhide*.



*C/R Hammers have malleable iron heads with replaceable coiled rawhide faces.*

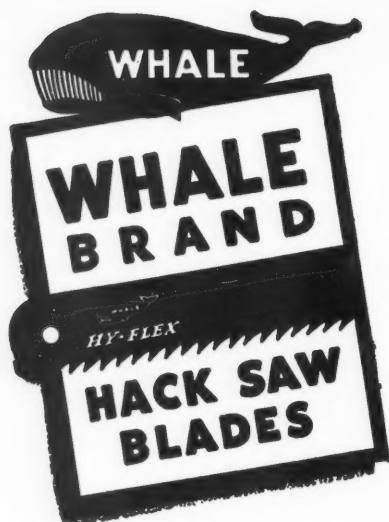


# CHICAGO Rawhide MFG.CO.

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CHICAGO 22, ILLINOIS

Other C/R maintenance products are: round, flat and twist belting; belt pins and belt lacings; gears, pinions and gear blanks; aprons and hand leathers; hydraulic packings.



Every Forsberg Blade bears the famous **WHALE BRAND** mark of quality. Scientific heat treating and thorough check every step of the way, plus a severe bending pounds test gives Forsberg Blades superior performance. The popular **HY-FLEX** Blade meets today's demand for extreme flexibility at medium price—it has the guts for solid service.



A Whale of a Blade—**MO-HY'S** special molybdenum steel gives unusual cutting service—same speed as tungsten with comparable performance. For outstanding results on stubborn jobs, ask your mill supply house for **WHALE BRAND HY-FLEX** and **MO-HY BLADES**.

Get to know the satisfaction in **Whale Brand Hack Saw Blades and Frames • Band Saws • Coping Saw Frames and Blades • Screw Drivers • Hand Drills.**



## Did You Know?

The **George Scherr Co., Inc.**, 198-A Lafayette St., New York 12, N. Y., has been appointed export representative for a complete line of transmission equipment, including Ramsey silent chain drives, Abart speed reducers, Lovejoy flexible couplings, Gerbing Roto-Cone pulleys, Atlantic gear products, and various other transmission items.

Following the annual meeting of shareholders, the directors of The Monarch Machine Tool Co., Sidney, Ohio, elected **Stanley A. Brandenburg**, general sales manager, as sales vice president and **Kermit T. Kuck**, chief engineer, as engineering vice president.

**Harold S. Graham**, president of John H. Graham & Co. Inc., 105 Duane St., New York 8, N. Y., recently returned from a business trip to Colombia, South America, where he visited all important industrial centers and renewed acquaintanceship with many of the company's customers.

The appointment of **F. J. Staroba**, formerly sales engineer for the Carbology Company, Inc., to the position of manager of the Midwestern district for Carbology, with headquarters in Chicago, has been announced by **K. R. Beardslee**, vice president and marketing manager of the company.

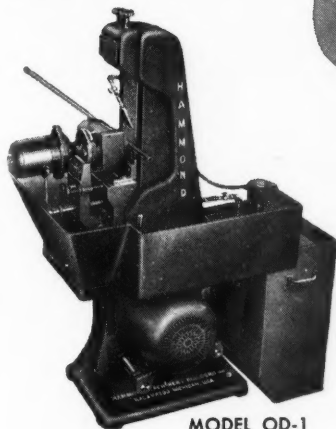
**Simplified Practice Recommendation for Rotary Files and Burs** has been approved for promulgation, according to an announcement made by the National Bureau of Standards. The recommendation will be identified as **R233-48**, Rotary Files and Burs, and will be effective from June 15, 1948.

The recommendation was proposed by the Rotary File and Bur Institute on behalf of a representative group of manufacturers of rotary files and burs. Based on an extensive study of consumer requirements, the recommendation establishes a simplified list of stock shapes, types, and sizes for hand-cut rotary files and milled and ground-from-solid burs. It also lists the number of teeth per inch and provides a glossary of standard terminology.

Until printed copies of **R233-48** are available, mimeographed copies of the recommendation may be obtained without charge from the Commodity Standards Division, National Bureau of Standards, Washington 25, D. C.

# DO YOU

## GRIND DEBURR POLISH BUFF



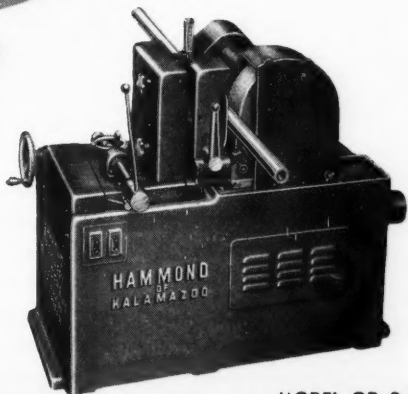
MODEL OD-1

**TUBES, RODS, BARS  
AND OTHER CYLINDRICAL  
SHAPES . . . PLUNGE CUT  
OR THROUGH-FEED**



**SEND SAMPLES . . .**

For a Complete Engineering Report on Your Work. Send Us One Finished and Several Rough Samples. No Obligation.

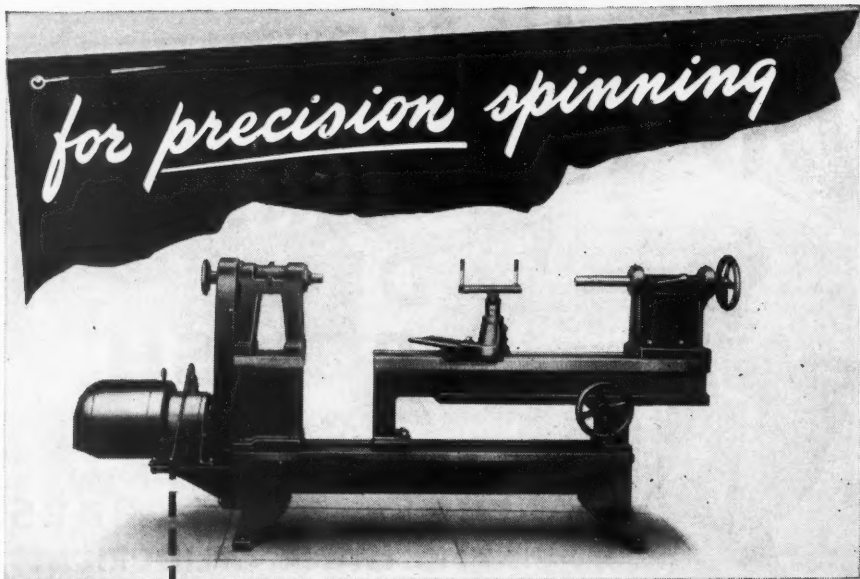


MODEL OD-9

*Hammond Machinery Builders*  
INC.

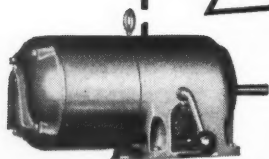
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For uniform precision spinning of large, odd or complicated shapes, you can depend on Bedinger Spinning Lathes . . . the Lathes of Quality, manufactured by Bedinger Precision Co., 566 West Avenue 26th, Los Angeles, California.

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REPRESENTATION IN MOST PRINCIPAL CITIES

LIMA GEARSHIFT DRIVES

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### *In Your Own Plant*

- Install anywhere by simple wire connection. Quiet in operation. No fumes or odors—no ventilating required.
- Any intelligent man can operate furnace with automatic temperature control, using established procedures.
- Operating cost under 4¢ per hour to hold 1600° F. in Model 3 furnaces, with 2¢ per kw.-hr. rate. Others in proportion.

**NOW YOU CAN** heat treat, harden and temper small parts in your own plant . . . without experienced heat treaters. Economical to install and use, Cooley Electric Furnaces operate efficiently at high or low heats, and save your large furnace time for work requiring large volume capacity. Here are some profitable uses:

**PRODUCTION HEAT TREATING** of small parts . . . Small batches . . . Running pilot lots to pre-determine mass production techniques . . . Emergency repairs . . . Industrial and laboratory testing . . . Miscellaneous controlled heating jobs.



CHAMBER	8"W 6"H 14"L				10"W 6"H 18"L				8"W 6"H 14"L	
MAX. TEMP.	1850° F.				1850° F.				2000° F.	
AMPERES	14.8 at 230 v.				19.6 at 230 v.				20.2 at 230 v. C	
WATTS	3400				4500				4650	
MODEL*	MH-3	VH-3	MK-3	VK-3	MH-4	VH-4	MK-4	VK-4	VK-5	VK-6
PRICE	200.00	230.00	250.00	280.00	295.00	325.00	345.00	375.00	420.00	340.00

\* M models complete with hinged door and hearth plate.  
V models have counterweighted vertical lift door.

K models include Selective Power Modifier for input control to correct temperature lag.

#### ACCESSORY EQUIPMENT

Electronic operated Veri-tron indicating and controlling pyrometer, with thermocouple and lead wire.....\$143.00  
Same in self-contained, enclosed panel including line switch and fuses, with steel stand—completely wired..... 273.00  
Steel stand with shelf..... 50.00

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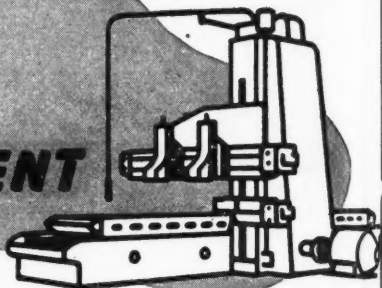
**COOLEY ELECTRIC MANUFACTURING CORP.**

34 South Shelby Street Indianapolis 7, Indiana

INDIANAPOLIS MACHINERY EXPORT CORP.

Export Manager, 44 Whitehall Street, New York, New York

## NEW SHOP EQUIPMENT



### Heald Models 421 and 422 Bore-Matics

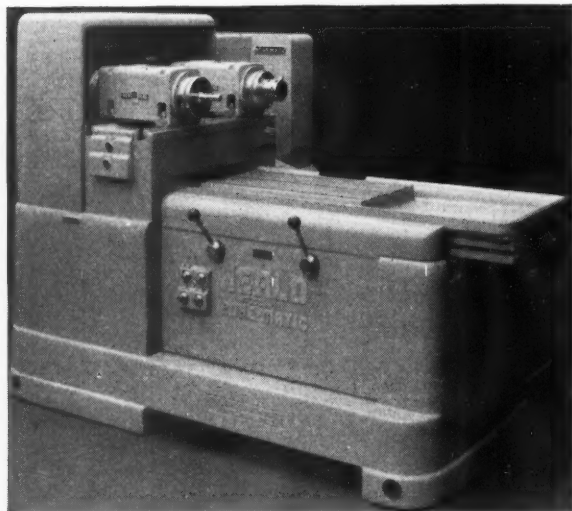
Capable of performing boring, turning, chamfering, grooving, facing, or fly-cutting operations separately or in any desired combination, the Heald Models 421 and 422 Bore-Matics illustrated herewith have been brought out by The Heald Machine Co., Dept. MMS, Worcester 6, Mass. The Model 421 is a single-end machine while the Model 422 is a double-end unit. According to the manufacturer, the machines are ideal for the mass production of a single part requiring several

operations or for single or multiple operations on several parts simultaneously.

The design of each model is such that up to 10 h.p. is available at each end of the machine, thus providing maximum power for heavy roughing cuts and higher speeds when using multiple heads. Grease lubricated at the factory, the boring heads are said to require no attention and are claimed to be extremely cool running. From one to four individual boring heads or a special multi-spindle head unit can be installed on each bridge, thus providing a wide range of application possibilities. A constant pressure

dump valve is arranged to automatically furnish only the amount of oil required during each phase of the entire machine cycle. The hydraulic feeds of the machine are said to remain constant throughout the day regardless of oil temperature changes, thus maintaining a definite production, finish, and accuracy.

The working height of each model is established for maximum operating efficiency, and all controls are located within easy reach from the fixture position.



Heald Model 421 Bore-Matic

# Starrett

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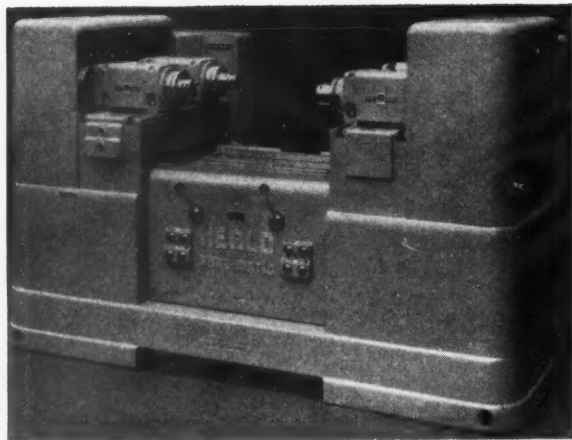


## STARRETT

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World's Greatest Toolmakers



Heald Model 422 Bore-Matic

A highly efficient table and boring head action are claimed to provide for fast machining cycles. The hydraulic system includes a valve and core plate construction which is said to require a minimum of piping, and the entire system is designed to eliminate leakage and to prevent the entry of foreign matter. Auto-

matic way lubrication and an improved cylinder piston design, which permits expansion without distortion, afford a smooth table motion necessary for the production of high quality finishes. All motors are part of a common power unit which is separated from the machine base and is easily accessible for maintenance. Positive circulation of air through the base and bridges and isolation of the hydraulic reservoir from the ma-

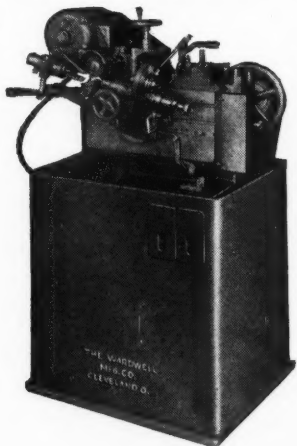
chine are claimed to nullify the heat transfer problem, thus reducing distortion to a minimum.

Provision has been made on the main control panel for the convenient installation of units for the operation of hydraulic fixtures, cross slides, chucks, and so on. Simple control settings make

## AUTOMATIC FLUTING OF TAPS and SPIRAL POINTING

Few small machine tools function in as many useful capacities as the 50 F. It not only has possibilities as a production grinder but also serves in many precision operations such as grinding of reamers, taps, milling cutters and small metal cutting saws. It indexes automatically and thus can be operated with unskilled labor.

*Write for Bulletin 50 F.*



**THE WARDWELL MANUFACTURING CO.**  
3166 Fulton Rd., Cleveland 9, Ohio

# ROGERS

## PATENT ADJUSTABLE HOLLOW MILLING TOOL

Quickly and easily adjusted — rugged in construction — rigidly locked when on the job.

Carbide tipped blades optional, are quickly interchanged with the high speed steel blades, for cutting the harder or gritty materials.

The Rogers Patent Adjustable Hollow Milling Tools and Solid Adjustable for Wear Reamers have been basic tools throughout the world for the past 62 years.

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## THE JOHN M. ROGERS TOOL CORP.

Gloucester City

New Jersey

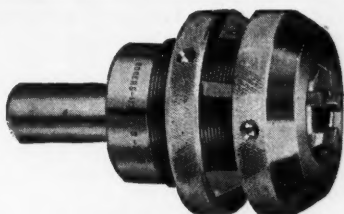


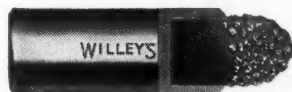
Fig. 20—Shank Integral



Fig. 23—Arbor Separate

# WILLEY'S DIAMOND DRESSERS

## NATURAL WHOLE DIAMONDS Set in WILLEY'S METAL



Willey's Diamond Dressers can be adapted to all makes of grinders, for rough, semi-finish and finished dressing, for grinding hardened parts requiring a precision ground finish.

A trial will convince you there is no wheel dressing tool on the market, costing two or three times the price, that will equal its performance and cost per dressing.

**WRITE FOR CATALOG 42** — Illustrates complete line of Willey's Diamond Tools and Mechanical Dressers.

No.	Usable Contents of the Diamonds		QUANTITY PRICES				Wheel Diameter
	Diameter	Length	1-25	26-50	51-75	76-100	
W-3	5/16	5/16	\$11.00	\$10.00	\$ 9.00	\$ 8.00	6 to 12
W-4	11/32	9/8	13.00	12.00	11.00	10.00	12 to 20
W-5	3/8	13/32	15.00	14.00	13.00	12.00	20 to 24
W-6	7/16	7/16	17.00	16.00	15.00	14.00	24 to 42

## WILLEY'S CARBIDE TOOL CO.

SOLE MAKERS OF WILLEY'S METAL

1342 W. Vernor Highway

Detroit 1, Michigan

available different rates of "in" and "out" feeds when two-way boring is required. Sensitive brake adjustments permit instantaneous braking action at predetermined points in the cycle, thus reducing boring time and tool wear when facing. The brake is self-compensating for band wear. The standard hydraulic circuit can be set to provide for a wide variety of cycles, many of which may be entirely automatic except for loading and unloading. A tray top table with over-flow trough and large chip pan is said to adequately handle chips and cutting fluid, thereby keeping the floor clean and assuring safe working conditions, it is claimed.

### Landis Tool Type CH-IW 10 x 30 Inch Hydraulic Grinder

The Landis Tool Co., 16 E. 6th St., Waynesboro, Pa., announces the development of a 10 x 30-inch multiple wheel plain hydraulic grinder designated as the Type CH-IW. The machine is designed to accommodate a multiplicity of wheels on a spindle between the bearing supports. With this arrangement, simultaneous grinding of many diameters on the

same shaft may be accomplished. The diameters being ground do not have to be straight. Provision has been made to profile dress the wheels so that tapers and other odd shapes may be finish ground.

The maximum work swing is 10 inches and the maximum outside dimension across the grinding wheels is 30 inches. The standard grinding wheel diameter is 36 inches; worn wheel size is 26 inches in diameter.

To remove the wheels when worn, the fender and wheel feed arm, both pivoted at the rear, are swung up out of normal position. By releasing hinged clamping blocks, the entire spindle and spindle bearing assembly may be lifted out of the machine. Retaining rings and wheels may then be easily removed without disturbing the bearing assembly. The 12-inch wheel holes allow the wheels and retaining rings to be slipped over the bearing housing.

Wheel dressing is effected by means of a table type diamond dresser. The table is traversed hydraulically. In order to dress the wheels to different diameters or shapes, depending on the workpiece, the diamond bar is made to follow profile bars mounted on the front of the bed. These bars are fully adjustable for ac-

## BRAND NEW PRECISION

# ROTARY TABLES



9"	— \$ 97.00
12"	— 160.00
15"	— 185.00
18"	— 220.00
18"	— 350.00 Extra Heavy Duty
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OUR ROTARY TABLE WILL TAKE THE PLACE OF A COSTLY FIXTURE. IT IS USED FOR ALL KINDS OF WORK ON MILLING MACHINES, SHAPERS, DRILL PRESSES AND HORIZONTAL BORING MILLS.

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Thread Gages. Drills,  
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THEM ACCURATELY?**

*You Need*  
**OPTI-LOCATOR!**

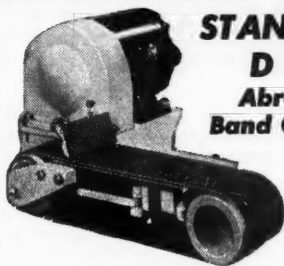


- Functions on any machine with cross-feed.
- Split - thousandth accuracy in 60 seconds.
- Convenient to use... cheap to buy.

*Write to*

**THE BENTON CO.**

Dept. M, 351 S. LABREA, LOS ANGELES, CALIF.



**STANDARD  
D - 4  
Abrasive  
Band Grinder**

**Famous  
for  
Stamina**

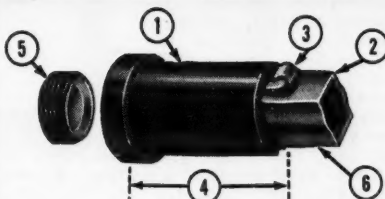
This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre... at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood. 4x36 $\frac{1}{4}$ " band. The ideal portable unit.

**OTHER STYLES AND SIZES IN NEW  
MANUAL ON FINISHING—WRITE TODAY**

**WALLS SALES CORP.**

306 E. 38th St., New York 16, N. Y.

## PEMCO BRUSH-HOLDERS FOR FRACTIONAL HORSEPOWER MOTORS COMPLETE RANGE OF SIZES...



1. Molded plastic casing
2. Extruded brass insert
3. Solder clip for easy assembly
4. Open dimensions to fit all requirements
5. Detachable cap
6. Ventilation area to reduce heat

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**WE MAKE...** a simplified brush holder that requires less material, assembly time, and labor... a product proven by over 10 years of wide use.

**YOU GET...** smooth brush action that insures lasting satisfactory performance. Practical—through complete range of sizes. Economical—through reduced all-around costs.

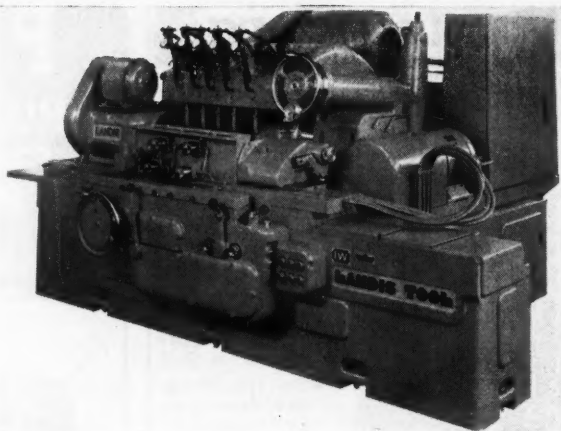
**PHOENIX  
ELECTRIC MFG. CO.**  
715 W. LAKE ST. CHICAGO 6, ILL.

**Landis Tool Type CH-1W 10  
x 30-Inch Hydraulic Grinder**

curate dressing. A rapid traverse is provided between wheels in order to reduce dressing time to a minimum.

The wheel spindle is mounted in Landis Tool Microsphere bearings, which are sealed and lubricated by pressure. The lubrication system includes a safety pressure switch to prevent the wheel drive motor from starting until the pressure is built up to a certain point, and conversely the wheels, it is claimed, will stop rotating if the pressure in the system ever fails. A separate reservoir and filter are provided for the wheel spindle lubricating oil.

Wheel feeds are hydraulically operated. Rapid feed advances the wheel to grinding position, and slow feed moves the wheelbase slowly for grinding. A built-



in device prevents the slow feed from starting until the rapid feed is against its front stop. The amount and rate of slow feed is adjustable. Hydraulic cushions are used for the front and return strokes of the rapid feed on the wheelbase.

Rates of hydraulic slow feed and hy-

# For PRECISION Built

*Specify*

COMPACT DESIGN

HIGH TORQUE

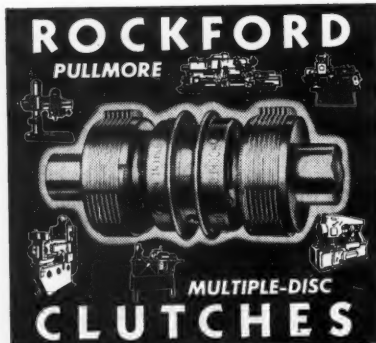
HIGH-RATIO LEVERS

POSITIVE NEUTRAL

PRECISION BUILT

LONG WEAR LIFE

EASY ADJUSTMENT



Precision machining and grinding, proper hardening and the symmetrical contours of PULLMORE Multiple Disc CLUTCHES insure perfect balance and smooth operation at both high and low speeds. Because of this close-tolerance construction and compact design the powerful pull of PULLMORE CLUTCHES is not affected either by centrifugal force or the direction of rotation.

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Handy Bulletin**

Shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications.



**ROCKFORD CLUTCH DIVISION**

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*Pullmore Clutches are sold by Morse Chain Co., offices in principal cities.*

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Each thickness a distinctive, easy to identify color. Impervious to oil. Long lasting. 5"x20" sheets. Special sizes to order. Handy assortment, shim stock, 12 colors—12 thicknesses (.001-.090). Bound together. \$4.25.

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## STERLING DRILL GRINDER



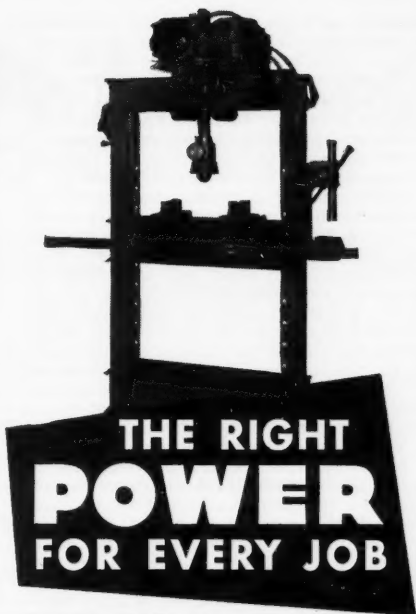
CAPACITY:  
3/8" to 2 1/2" drills.  
5" x 9" adjustable table.

MOTOR: 1/2 hp,  
3450 rpm.

NET WT: 250 lbs.

CRATED: 320 lbs.

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EAU CLAIRE, WISCONSIN, U. S. A.



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**POWER**  
FOR EVERY JOB

## LEMPCO Pressurematic Press

... enables you to select the correct pressure for every job: press fitting, assembling, bending, straightening and die try-outs. Pressure builds from 0 to 60 tons in just four seconds. Movable head permits rapid centering of ram over work. Adjustable bolster accommodates large and small jobs. Strong, sturdy construction assures safety factors in excess of the limits of the press.

Lempco Pressurematic Presses are made in electric and hydraulic models, in 20, 40 and 60-ton capacities. Each will pay for itself many times over in your shop. Write for fully-illustrated catalog.



### Exclusive

Automatic Pressure Control—stops ram travel at pre-selected pressure. Prevents costly spoilage, speeds assembling operations. Ideal for production line.

# LEMPCO

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draulic carriage traverse are controlled by throttle valves at the front of the machine. Built-in locks on these valves may be provided so that the feed and traverse rates can be set for best results. All operating controls, such as hand traverse, traverse start-stop, infeed lever, carriage reversing and electrical push buttons, are grouped at the operator's position.

Hydraulically operated backrests are mounted on the swivel table. These units, which automatically move into position at the end of the rapid feed stroke, have Carboly-tipped shoes and are fully adjustable for different diameters. Drives to the headstock spindle and wheel spindle are effected through V-belts. Change pulleys are furnished for the wheel drive so that spindle speeds may be increased when wheels are worn. The headstock has four speeds ranging from 54 to 150 r.p.m. Changes may be made by shifting a V-belt on a stepped pulley.

Electrical motors and controls are located about floor level in order to conform to the latest automotive and machine tool electrical standards. The bed is a one-piece casting, with built-in leveling screws. Separate reservoirs are provided for coolant, hydraulic oil, and guide lubricating oil. The coolant reservoir has a capacity of 100 gallons, settling

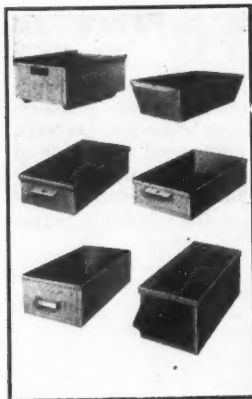
baffles, and cleanout along the side of the bed.

The lubricating oil reservoir in the bed contains oil for the wheelbase and carriage guides. This system employs a safety pressure switch and filter. In the event that the pressure in the system should fail, the machine is arranged to shutdown. The carriage guides are also protected by covers which are said to prevent dirt from settling on the guides regardless of the position of the carriage.

### Nichols Twin Miller

The W. H. Nichols Co., Dept. MMS, Waltham 54, Mass., announces the Nichols Twin Miller, an unusually versatile double-spindle high-precision machine which is said to be particularly useful for light-duty work where two surfaces can be milled in a single pass. The machine has two opposed independent geared milling heads each of which is powered by a pancake type motor and has available 15 spindle speeds from 55 to 2,080 revolutions per minute.

Each milling head is adjustable in three planes: horizontally by means of slides and set screws; vertically; and transversely by feed screws with direct



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18" x 12" x 6". 16 Ga.  
with Drop Handles

### STANDARD SIZES

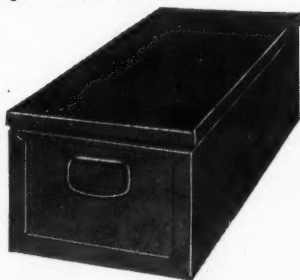
16 x 10 x 6 . . . . 18 Ga.

16 x 10 x 6 . . . . 16 Ga.

18 x 12 x 6 . . . . 16 Ga.

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### WE MANUFACTURE ALL TYPES OF STEEL BOXES

We make a specialty of boxes made to fit your particular handling requirements. Special boxes designed so they can be run thru with standards enable us to quote prices comparable with that of a standard box.

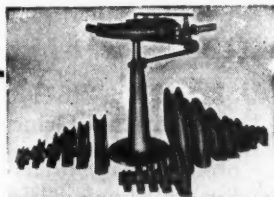
**STERLING**  
FACTORY EQUIPMENT CO.

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PROVIDENCE, R. I.

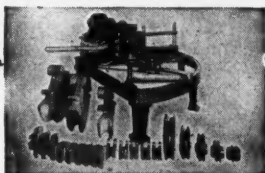


*The "American Way"*

**BY HAND or MOTOR  
MACHINES TO BEND COLD PIPE, CONDUIT, BOILER TUBING  
AND SOLID BAR . . . BENDING TABLES ALSO AVAILABLE**



Above: Hand-powered Type A-30 . . . up to 180° bends . . . all sizes from  $\frac{1}{2}$ " to 2". Only 7 parts. World's fastest, simplest machine. Note assortment of bending dies . . . this process makes shorter tangents than any other. Occupies only 18" x 18" floor space!



Above: Motor-powered Type E . . . bends fixed radii of 6 to 1 up to 90°. Type E bends  $2\frac{1}{2}$ ", 3",  $3\frac{1}{2}$ " and 4" pipe. 3 horse-power motor. Floor space occupied—7' 6" x 7' 6". Other power machines up to 8" capacity.

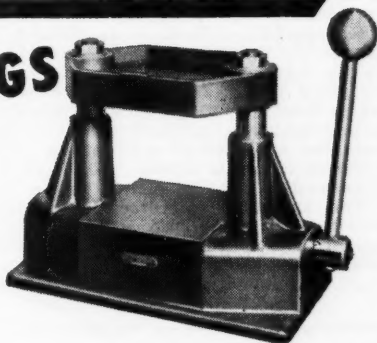
*Other Sizes Available*

**Factory and Main Office: 14 Furnace St.,  
Poultney, Vermont**

*"American"*  
**PIPE BENDING MACHINE**  
*Company INC.*

**"Cone-Lok" JIGS**  
ACCURACY  
YOU CAN TRUST

- MECHANICAL SIMPLICITY
- ADAPTABILITY
- RUGGED CONSTRUCTION
- CHIP PROTECTION
- SEALED LUBRICANT
- MAXIMUM SAFETY

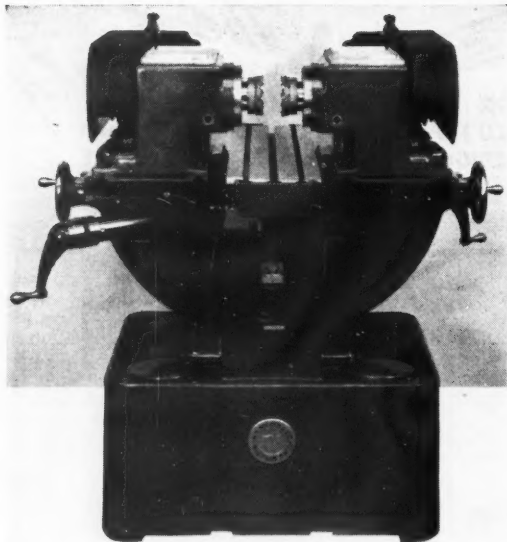


The Woodworth "CONE-LOK" jig utilizes the full braking power of its perfectly mated male and female cones.

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heavy box section semi-steel castings. All finished surfaces are ground and hand scraped where necessary for a high degree of accuracy.

### Bryant No. 216 Hydraulic Internal Grinder

Designed to fill the need for a precision high production automatic internal grinder requiring minimum operator attention, the Bryant No. 216 Hydraulic Internal Grinder shown herewith, product of the Bryant Chucking Grinder Co., Springfield, Vt., is provided with a 16-inch swing inside the standard water guard and with a 15-inch total wheel slide traverse. (The swing is limited to 12 inches

when grinding tapers greater than 15-deg. included angle). The maximum height of spindle center line above table is 12 inches and the minimum height is 1½ inches. The maximum distance between spindle noses across table is 16 inches and the minimum distance is 4 inches. Vertical attachments, which may be fitted to either spindle, provide for wider flexibility. The 8½ x 34-inch table is pneumatically powered by a solenoid-operated air cylinder and has a maximum travel of 12 inches and 9-inch hydraulically controlled cutting stroke.

The Nichols Twin Miller requires a 4 x 5-foot floor space and is 55 inches in height. The construction of the machine is described as rugged yet extremely precise. The knees, saddle, and table are

when grinding tapers greater than 15-deg. included angle).

The Bryant No. 216 Grinder is generally suited for grinding work with bores up to 8 inches in diameter; the grinding traverse permits grinding of 6-inch bore lengths. For the smaller ranges of bores, Bryant high frequency wheel spindles operating at speeds up to 100,000 r.p.m. may be used. A variety of standard or special tooling may be employed in conjunction with the machine to meet the particular needs of the user.

Maximum rigidity is said to be provided in the design of the machine by the cylindrical slide construction. The slide bar to which the wheel slide is attached is supported in two bearings in the base

### Faster Tube and Pipe Cutting

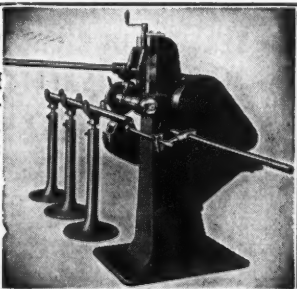
**S**TEEN High-Speed pipe, tube and column cut-off machines embody unique design and rigid construction features to greatly step up cut-off operations. Available in three sizes to cut diameters ½" to 3"; ½" to 6"; 3" to 12".

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that licks the toughest sanding jobs  
— this SMOOTH COMBINATION

## SIOUX RESIN BOND Abrasive Discs

Cut faster with less effort. They're flexible, tough, long lasting, non-loading, give maximum cutting action and remain cool. It's the ideal disc for any and all sanding operations



## SIOUX High Speed Sanders

Ball-bearing construction, heat treated alloy steel gears, permanent lubrication. Cyclone fan for increased ventilation and patented tool spindle lock for changing discs. 3 Models: No. 1250—9" High Speed Heavy Duty; No. 1267—7" High Speed Heavy Duty and No. 1265—7" Special.

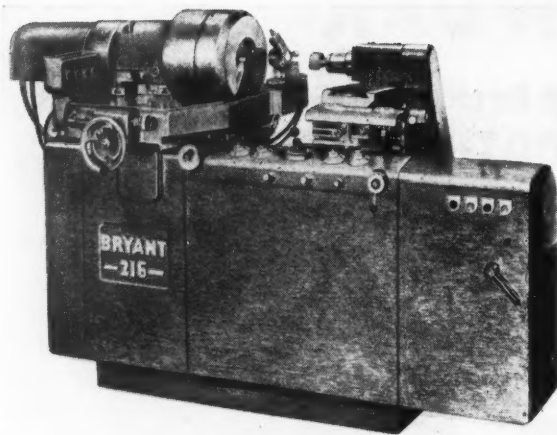
Sold only through  
authorized SIOUX distributors

No. 1267 SIOUX Heavy Duty Sander (illustrated) No load speed 4250 R. P. M. Universal motor operates on A.C. or D.C. Overall length 15"—weight 13½ lbs. A very popular model.

STANDARD THE  
ALBERTSON & CO., INC.



WORLD OVER  
SIOUX CITY, IOWA, U. S. A.



Bryant No. 216 Hydraulic  
Internal Grinder

of the machine, and a shoe beneath the rear of the wheel slide follows a hardened and ground control plate. The wheel slide is thus supported at three points, each of which is provided with pressure feed lubrication.

The cross feed is obtained by lateral

that change-over from one method to either of the others can be accomplished merely by the addition of the sizing equipment. Sizing from the diamond is effected by grinding a predetermined amount beyond the wheel truing position. Compensation for wheel

motion of the work table, which is supported by specially designed roller bearings. The various movements of the machine are hydraulically controlled to afford flexibility of operation between the various units. Cycle control is accomplished electrically so that the cycle can be readily changed to suit varying working conditions.

Three methods of automatic sizing are provided for the machine. The basic machine is so equipped

## If you handle Rotating Parts

If your shop handles rotating parts these sturdy and dependable balancing ways would be highly profitable equipment to use. In accurate balancing and truing operations they save time, labor and money. No leveling required.

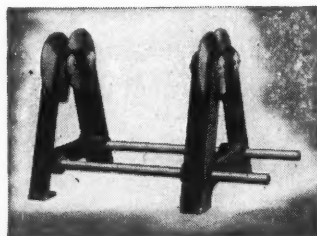
Four chilled iron disc rotate with minimum friction on sensitive special bearings, giving a quick,

accurate indication of whether or not the work is in perfect balance.



Write for Bulletin No. 22-6

**Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters, Hand and Power Hydraulic Straightening Presses.**



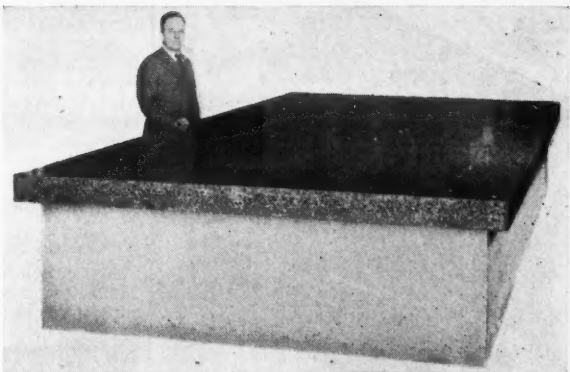
### ANDERSON BALANCING WAYS

Swing	Distance Between Standards	Capacity in lbs.
20 in.	20 in.	1,000
40 in.	30 in.	2,000
30 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000

### Herman 8 x 16-Foot Granite Surface Plate

wear is automatic. Automatic plug sizing is accomplished by a plug gage mounted in the work spindle, which automatically checks the bore size after each pass of the grinding wheel. As the plug gage enters the bore, the machine automatically stops grinding, and the wheel is withdrawn from the bore ready for loading of the next workpiece.

A third method of sizing can be utilized wherein a diamond tipped finger, contacting the bore as it is being ground, operates electrical contacts at the proper time to arrest the grinding action of the machine, withdrawing the wheel from the bore ready for the insertion of the next workpiece. For taper grinding, the wheelhead is swung about a center directly under the chuck.



### Herman 8 x 16-Foot Granite Surface Plate

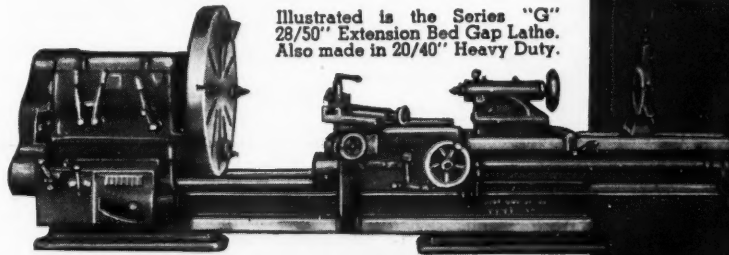
Said to be finished to a tolerance of 0.002 inch overall, the 8 x 16-foot precision granite surface plate shown herewith has been brought out by The Herman Stone Co., 324 Harries Bldg., Dayton 2, Ohio. This one-piece surface plate weighs approximately 25 tons and is in-

## Extension Bed Gap Lathes

The Extension Bed Gap Lathe is designed to be used either as a gap lathe or an engine lathe. We also manufacture a line of regular geared head engine lathes.

Write for circulars.

Illustrated is the Series "G" 28/50" Extension Bed Gap Lathe. Also made in 20/40" Heavy Duty.



*The Nebel Machine Tool Co.*  
CINCINNATI OHIO

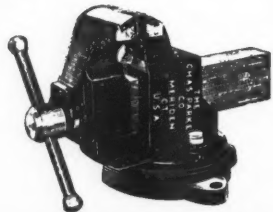


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The famous construction features of Parker Vises invite action! Here's why: Quick, powerful grip without slack—renewable steel jaws covering entire top of vise—360° swivel base, brake-type locking at any desired point—solid-cast underportion for strength—and non-pinch tension spring handle. Soon—a new line of hinged pipe vises and woodworking vises. Sold 100% through leading distributors. The Charles Parker Co., Meriden, Conn.



**NOW! Parkers are unit packaged—factory-new to you.**



**PARKER VISES**

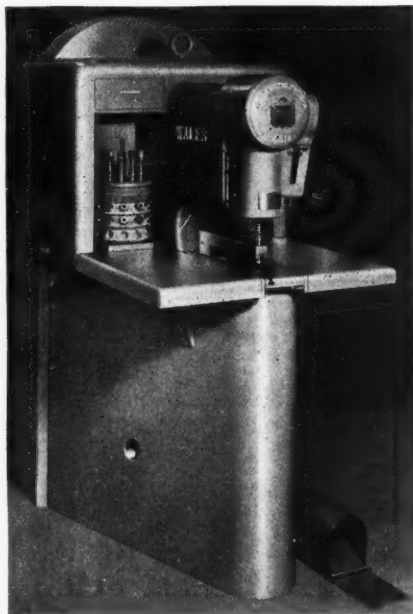
*America's First Vise Maker*

tended for use in checking stampings as long as 144 inches.

According to the manufacturer, its non-warping qualities and accuracy, as well as its hardness, make the plate highly desirable for large stampings and eliminate the necessity, for periodic checking and adjustments.

### **Wales Sheet Metal Fabricator**

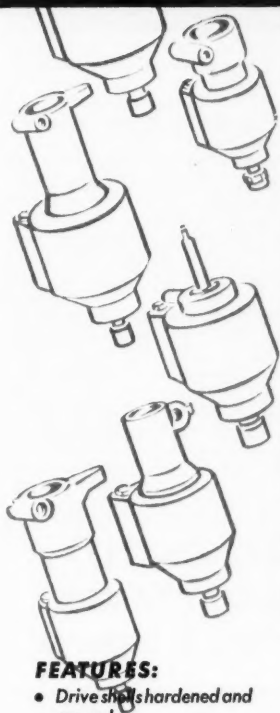
Announcement of the Wales Sheet Metal Fabricator for punching, notching, nibbling, bending, forming, and blanking



**Wales Sheet Metal Fabricator**

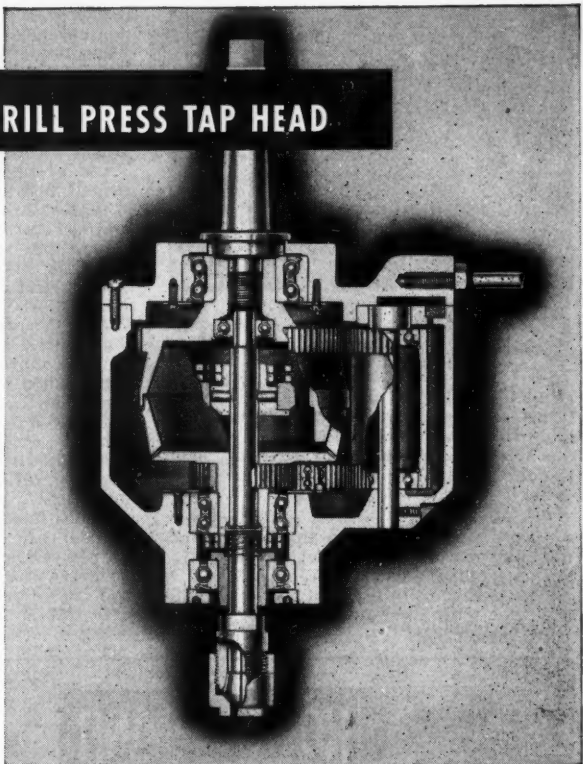
operations has been made by the Wales-Strippit Corp., Dept. MMS, 345 Payne Ave., North Tonawanda, N. Y. The design of the unit includes a self-contained punch holder which is slidable on ways in the press bed. Various round and shaped punches and dies can be instantly interchanged in the holder to provide a "quick-change" punch and die system. The ease with which punches and dies can be interchanged permits the selection of the proper die clearance for the

## SNOW DRILL PRESS TAP HEAD



### FEATURES:

- Drive shaft hardened and ground.
- Spindle in balance.
- Light weight clutch
- Spindle bushing revolves with bearing.
- No lateral float.
- Collets ground through-out.
- Eight ball bearings.
- 2:1 reverse speed.
- Hardened alloy gears and studs.
- Delivery from stock.



The SNOW Drill Press Tap Head is the same unit as used on the SNOW Full Universal Tapping Machines. It is the only Tap Head designed and manufactured for a machine tool by a machine tool builder.

Engineers and mechanics will recognize the rigid, sturdy construction; and operators will vouch for length of service, ease of operation, and quality of work produced.

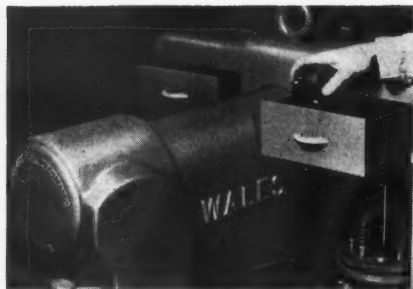
Eighteen years of production testing, and thousands of installations have proven the advantages of using a precision built drill press tap head.

These units are available in three sizes—0 through  $\frac{1}{4}$ "; No. 6 through  $\frac{3}{8}$ "; and No. 10 through  $\frac{1}{2}$ "—both Morse taper and quill clamp styles are in stock.



**SNOW MANUFACTURING COMPANY**

443 EASTERN AVE., BELLWOOD, ILL. • SUBURB OF CHICAGO



Close-Up View of Wales Fabricator  
Illustrating Drawers for Accessories

gauge of material to be punched by merely inserting a die having the proper clearance for that punch. Three dies of various clearances are provided for each punch to accommodate material up to  $\frac{1}{4}$ -inch thickness.

The Wales Fabricator is designed with a 5 $\frac{1}{2}$ -inch opening under the ram to permit using standard Wales Type "BL" hole punching units and Wales Type "N A" notching units. Standard Wales sliding filler plates are interchangeable with

the Wales sliding holder used with the "quick-change" system. Tapped hold-down holes and pilot pins are located in these sliding filler plates for mounting Wales standard units.

Nibbling around guide plates is practically an automatic operation on the Wales Fabricator by positioning the nibble lever to provide continuous, uninterrupted operation of the ram. A special extended and adjustable holder with a manual turning device is available to permit the work to swing at the center point for nibbling out full circles, semi-circles, and arcs.

One of the outstanding features of the Wales Fabricator is the Hydra-New-Matic head which operates with a minimum of vibration and noise at 165 strokes per minute for single hole punching and for nibbling. A light built into the head housing automatically glows when the control switch is turned on. An anti-jam device in the head is released by simply backing off a screw to relieve the oil pressure.

A full-floating drive shaft construction places ram load directly on the frame proper, thus eliminating bending stress on drive shaft. The flywheel operates on the frame bearing with no weight on the drive shaft. A non-repeat, feather-touch

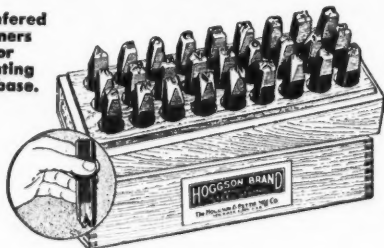


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*Since 1849*

## HAND-CUT STEEL STAMPS Letters & Figures

Deep, hand-cut letters in special-formula steel—result of 90 years of die making—assure clean impressions and long service. Face of stamp is angled for extra strength. Ideal for parts and tool marking and numbering. Also made in reverse for marking molds and dies. At mill supply houses.

Chamfered  
corners  
for  
locating  
the base.



**HOGGSON & PETTIS MFG. CO., New Haven, Conn.**



lever provides for release of the ram instantaneously for downstroke. This lever must be depressed for each cycle of the ram for single-stroke operations. The nibble lever controls the non-repeat device for continuous, uninterrupted operation of the ram for nibbling.

The one-piece steel casting frame is scientifically designed to provide maximum rigidity vertically, horizontally, and torsionally. A wide unobstructed bed table is provided at the correct height to allow for easy feeding of large sheets or for the operator to sit down while feeding small pieces. A slug clearance tube hole in the lower left side of the press frame directs slugs to out-of-the-way containers.

Dual control of the ram strokes is provided by an adjustable foot trip mechanism for use when both of the operator's hands are required to feed work or when large sheets make it awkward to use the hand trip lever. The foot control may be freely placed at any point within a distance of 4 feet from the outlet in the base.

Complete sets of graduated punch assemblies and dies are located within an arm's reach on the two "revolvable" storage spindles. These punch and die sets are for punching round and shaped holes with the Wales "quick-change" system which permits rapid changing for punching various round hole diameters and shapes up to  $\frac{1}{2}$ -inch and in  $\frac{1}{8}$ -inch thick mild steel.

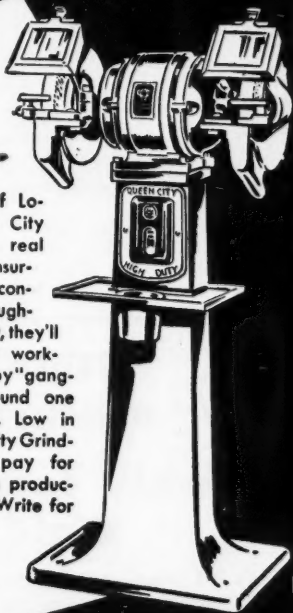
### Harvill Model AHH-1 Semi-Air Die Casting Machine

The H. L. Harvill Manufacturing Co., P. O. Box 177, Corona, Calif., announces the addition to its line of production die casting machines of a small semi-air die casting unit designated as the Model AHH-1. The machine is a small production model with injection of the metal effected by air pressure through an immersed injection piston assembly.

The machine is designed to cast zinc, lead, and tin base alloys through a center gate. The dies are opened and closed by hand, with the ejection of the castings after solidification accomplished by the same manual method. The machine has safety-interlock features which are said to eliminate the possibility of injecting or "shooting" the molten metal into the die cavities unless and until the dies are locked in their closed position, thus providing protection to the operator against the accidental spraying of molten metal.

## SAVE TIME, MONEY

with rugged  
**QUEEN CITY  
GRINDERS**

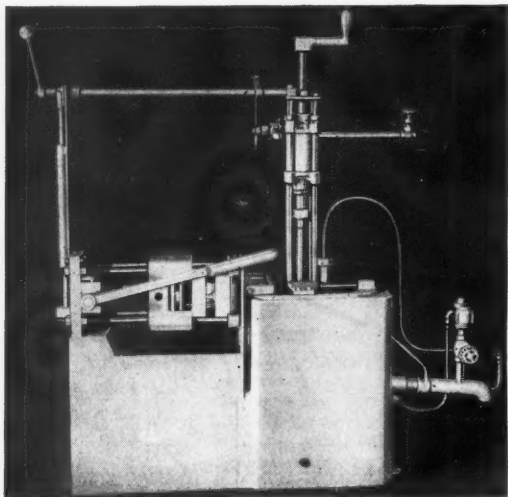


A battery of Low Cost Queen City Grinders is real production insurance. Placed conveniently throughout your plant, they'll stop wasted work-hours caused by "ganging up" around one lone grinder. Low in cost, Queen City Grinders quickly pay for themselves in production gained. Write for Catalog.

## QUEEN CITY

### MACHINE TOOL CO.

233 E. 2nd St.,  
CINCINNATI 2, OHIO



Harvill Model AHH-1 Semi-Air Die Casting Machine

actual speed of operation being dependent upon the operator and the nature of the parts being cast. The machine is equipped with a gas burner unit requiring 330,000 B.T.U. per hour maximum. An oil burning unit may also be obtained. A volume of 8 cubic feet of air per minute is required to operate the machine at its maximum rate of 500 cycles per hour.

Standard die blocks are available with the machine. Diemaking is said to be greatly simplified since the ejector box and plate are made a part of the platen of the machine, which may be obtained complete with dies made to user specifications.

According to the manufacturer, the Harvill Model AHH-1 Die Casting Machine is capable of operating at a speed as high as 500 cycles per hour, the

Specifications of the Harvill Model AHH-1 Die Casting Machine are as follows: normal die dimensions (vertical by horizontal), 6 x 10 inches; dimension

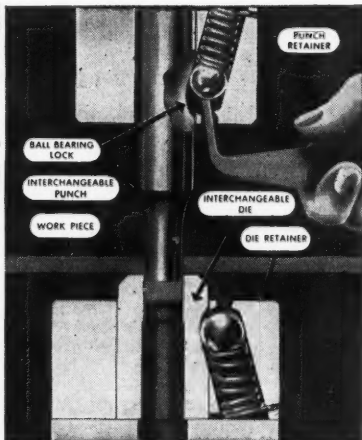


## INTERCHANGEABLE PUNCHES and DIES

### Quickly Inserted... Rigidly Held!

Allied's R-B Interchangeable Punches and Dies are quickly inserted—rigidly held for accurate, trouble-free punching in the metal-working and plastics industries. They are available from stock in standard round, oblong and square shapes of almost any required size. Specials of any size, shape or material are promptly furnished to your specifications... and delivery dates are dependable.

Large, illustrated R-B Catalog gives complete details, specifications. Write for it.



## ALLIED PRODUCTS CORPORATION

Department 23

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# INTERESTED IN A 300% INCREASE IN STAMPING PRODUCTION USING YOUR PRESENT PRESSES ?



*Photo courtesy of  
Federal Tool Corp., Chicago, Ill.  
Designers and builders of  
9 Station Progressive Dies*

## THEN INSTALL ONE OF THESE NEW, LOW-COST DICKERMAN DIE FEEDS

**THIS IS NO FAIRY TALE.** Dickerman Die Feeds are actually increasing production 300% or more in many shops. They will do the same for you, used on your present punch presses.

**IN ADDITION,** they reduce operator hours 80 to 90 per cent, due to their accuracy, reliability, versatility. They increase die life through elimination of costly jams and crack-ups — can be attached to any Press.

**THESE FIGURES ARE FACTS,** so why look further? Replace worn punch press feeds **NOW** with the new improved Dickerman Die Feeds. Send for free illustrated catalog **TODAY.**

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**322-67 ALBANY STREET • SPRINGFIELD, MASS.**

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Vac-It is fast and efficient with more than enough power to handle any cleaning job in your plant.

Vac-It is safe. Every part is enclosed for protection to the operator and for better performance under all working conditions.

Vac-It is easy to use and simple to handle, requiring a minimum of time and labor. Engineered cleaning attachments do the reaching and stooping for you.



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for  
Complete data*

**Doyle**  
**VAC-IT**

**DOYLE VACUUM CLEANER COMPANY**  
3225 Stevens St., S.W., Grand Rapids 7, Mich.

between dies (open), 5 inches; maximum die thickness (dies closed), 6 inches; die platen size (vertical by horizontal), 10½ x 10 inches; clearance between 1-inch tie bars, 6½ x 6 inches; metal injection capacity (standard zinc alloy), 14 ounces; overall width of machine, 1 foot 3 inches; overall length, 4 feet 4 inches; and overall height, 5 feet.

## **Staple Model B-3 Honing Machine**

Designated as the Model B-3, a honing machine which is designed to hone parts having inside diameters ranging



**Staple Model B-3 Honing Machine**

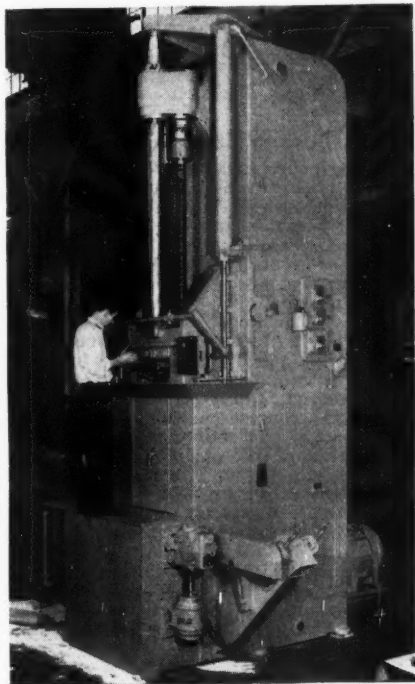
from ¼ to 4 inches has been brought out by the Staple Engineering Co., 1315 S. Woodward Ave., Birmingham, Mich. A machined surface is provided on which work-holding fixtures may be mounted. For production work, the parts are held in a fixture and stroking is effected by hand. However, for toolroom work when honing small lots, the work is generally held and stroked by hand.

The spindle of the Staple Model B-3 Honing Machine is powered by a ½ h.p. motor through a variable speed drive.

When using a 1,200 r.p.m. motor, spindle speeds are variable from 300 to 980 r.p.m. and with a 1,750 r.p.m. motor, spindle speeds are variable from 490 to 1,480 revolutions per minute.

## American Vertical Pull-Up Internal Hydraulic Broaching Machine

The American Broach & Machine Co., Dept. MMS, Ann Arbor, Mich., announces the completion of a vertical pull-up



American Vertical Pull-Up Internal Hydraulic Broaching Machine

internal hydraulic broaching machine which has an overall height of 16 feet 10 inches, gross weight of over 17 tons, normal operating capacity of 30 tons, and broaching stroke of 60 inches. Designed to broach involute splines in gear blanks on a high production basis, the machine features a helix lead and nut bar for driving the broaches during the pulling stroke. An additional feature is

for

# SMALL HOLE DRILLING

*Speed-Right*  
means the *Right* cutting speed,  
instantly set and accurately maintained

### SPEED-RIGHT 8" BENCH DRILL PRESS

Speed-Right Precision Drill presses combine the right drilling speed, sensitivity of feed and vibrationless operation for the fast, economical production of small holes .004" to 5/32".

The exact speed requirements for your particular job (within range 1000-10,000 or 2500-15,000 RPM) can be instantly set, and once set, will be accurately maintained by a centrifugal force electrical governor.

Selective quill feed provides a normal direct drive for drills larger than No. 60, and super-sensitive "Micro-feed" through back-gears for drills down to .004" in diameter.

To minimize vibration at the higher speeds required for smaller, more fragile drills, the motor, speed control unit and chuck are all mounted on a single spindle. Large, wide spaced bronze quill bushings assure lasting accuracy.

For descriptive bulletin, write

THE ELECTRO-MECHANO CO.  
261 EAST ERIE STREET MILWAUKEE 2, WIS.

the lower guide which not only raises the broaches up to the pull heads but also continues up, providing the large broaches with additional alignment during the broaching stroke.

Operation of the machine is obtained by the use of push-button controls, and all operating cycles are electrically interlocked as a safety measure for the operator and machine mechanism. One complete cycle provides for the production of two parts, which are first loaded into a slide while the broaches rest in the lower guide. The slide is then pushed into position and push buttons are depressed

to start the machine cycle. The broaches are raised by the lower guide until the shank ends come up through the parts and are connected in the automatic broach pull heads. The main machine ram then starts the broaching stroke, and the lower guide continues up, providing alignment for the principal portion of the cutting action. When the broaches reach the top portion of the cycle, the operator unloads the parts and then starts the main slide down, returning the broaches to the lower guide.

The machine is equipped with a chip conveyor for removing excess chips which accumulate in the coolant reservoir. Normally, the machine is installed in a pit with the operator's platform at floor level.

## Heavy Duty • Bench Type

### ENGRAVING MACHINE

Interchangeable heads for engraving, electrical marking, and acid etching . . . available for all models. Also Panto engraving cutters, cutter grinders, master copy type, endless belts and accessories.



The PANTO  
MODEL UE-3

LIGHTER MODELS UE and UE-2

Catalog  
On  
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H. P. PREIS ENGRAVING MACHINE CO.

657 Route 29

Hillside, N. J.

### Bliss Welding Press

The high speed assembly of large metal sections is said to be possible on a welding press developed by the E. W. Bliss Co., 450 Amsterdam Ave., Detroit 2, Mich. In operation, the units to be assembled are placed in position on the lower die or preloaded on conveyors, after which the press cycle is completed automatically. The lower die is raised until it contacts the upper die, which contains welding tips placed in positions corresponding to the spots to be welded on the metal section. Limit switches stop the slide in the correct position, provide for production of the welds, and return the slide to the lowered position when all the welds are completed. The spot welding is done electrically, and any number of welds can be made at once.

The welding press is available in two models, which are essentially the same except for the position of the driving mechanism. For use in shops with limited headroom, the 4LU series is designed with the driving unit in the base. Where

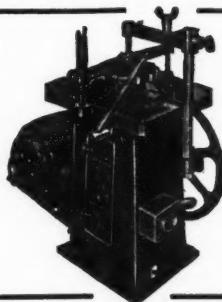
## NO BUSHINGS, GUIDES or PILOTS NEEDED!

### THE READING BENCH KEYSEATER

The Reading Bench Machine requires no bushings, guides or pilots. No other machine like it. Very fast—capacity from  $\frac{1}{8}$  to  $\frac{3}{8}$  cutter.

*Low first cost—prompt delivery.*

READING MACHINE COMPANY, Reading (Cincinnati), Ohio





# Are You Tapping—



Plastics?



Abrasive  
Materials?



Jobs that  
require plating  
after tapping?

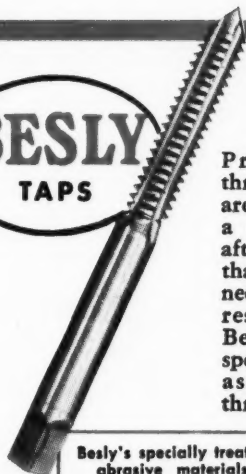


Die Castings?



Sheet Metal?

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Problems involved in threading materials which are highly abrasive or have a tendency to "close in" after tapping require more than ordinary tap engineering. Through intensive research on these jobs, Besly can now provide specially treated taps that assure clean, accurate threading of such materials

at the lowest possible cost.

Check the chart below—see how many of your tapping problems demand the qualities specifically provided by specially treated taps. Then check with your nearest Besly distributor today. He'll be glad to lend a "Helping Hand"—without obligation.

Besly's specially treated taps for threading plastics, abrasive materials, die castings, etc. give:

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crease tap life.



**Free Cutting —**

For Automatic  
screw machine  
work.



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To accept  
gauge after  
plating.



**Free Assembly —**

With power  
screwdrivers.



Besly's "HELPING HAND"  
Has 5 Strong Fingers



- Fast Delivery
- A Complete Line
- Top Tap Quality
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Write for this  
**FREE Tap  
Manual  
Today!**

You'll Do  
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with

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CHARLES H. BESLY & COMPANY • 118-124 North Clinton Street, Chicago 6, Illinois  
Factory: Beloit, Wisconsin



Bliss Welding Press

headroom is no object, the 4L series has the driving mechanism in a more accessible position on top of the press. The 4L series also permits a change of stroke from 12 to 16 inches without change of parts. In both series, the lower die moves up to contact the stationary upper die, and is supported at four points to assure accurate positioning.

### Standard Redesigned No. 35 Variable Speed Snagging Grinder

The Standard Electrical Tool Co., 2487 River Rd., Cincinnati 4, Ohio, announces a complete redesign of its No. 35 twin-

motor infinitely variable speed snagging grinder. The machine is a 2-in-1 unit, each operating end being entirely independent of the other. The wheel on one end of the machine may be stationary while the wheel on the other end is operating. One end may be operated with a wheel differing in diameter to the other end; however, each wheel is operated at its correct and efficient peripheral speed.

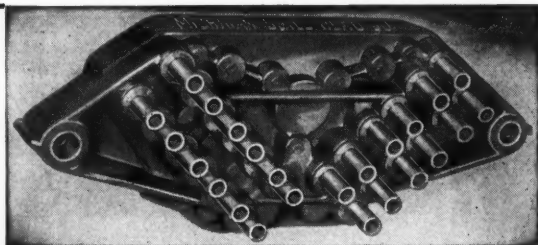
The No. 35 has two independent spindles, two  $7\frac{1}{2}$  h.p. motors, two magnetic starters, two start-stop push-button stations, two shaft locks for use in changing wheels, two infinitely variable speed drives, two handwheel speed controls, and two interlocking arrangements to prevent overspeeding of the grinding wheels. As the individual grinding wheel wears, the guard is adjusted and the handwheel speed control turned, a limit stop reflecting the correct spindle speed in relation to the worn wheel diameter. A full diameter wheel, it is claimed, cannot be mounted until the handwheel speed control has been reversed to its original position. This action allows the wheel guard to be brought to its extreme forward position to provide clearance for the full diameter wheel.

The ball bearings of the machine are protected in large size oil reservoirs with labyrinth seals and sight feed oil gages.

**Pictured: a 24-Spindle Heavy-Duty Drill Head.**

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MANUFACTURERS  
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**We Invite Your Inquiry.**

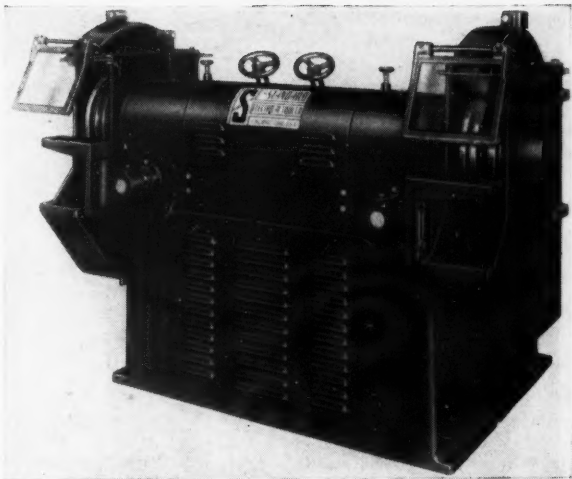


**MICHIGAN DRILL HEAD CO. 971 E. 8-Mile Road, Hazel Park, Mich.**

**Standard Redesigned No. 35  
Variable Speed Snagging  
Grinder**

The wheel guards are made of structural plate steel and each guard is provided with a hinged door. The sturdy 4 x 9-inch work rests are adjustable and removable.

Other sizes of double-end snagging grinders, as well as single-end units, are also available.



**J & L 434 MM. Projection Lens**

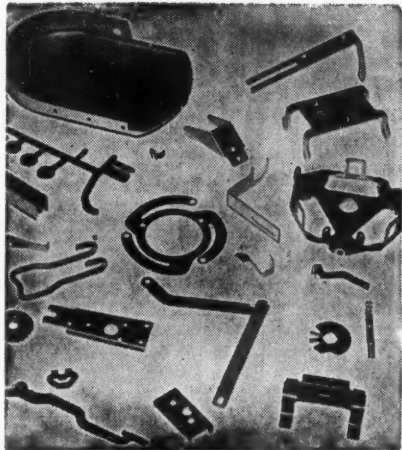
The Jones & Lamson Machine Co., Dept. MMS, Springfield, Vt., announces that highly successful results are being obtained from its recently designed 434

mm. projection lens, used on a special blade checking optical comparator designed by the company for inspecting foil contours on turbine blades.

The lens system is said to take in a

# **DIE CUT PARTS**

NEW • SPEEDY • ECONOMICAL



## **For Experimental and Model Work**

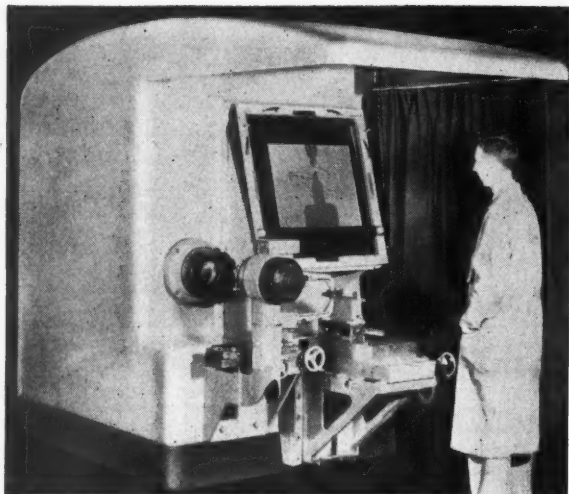
**Our Specialty:** Small irregular shaped parts stamped, formed, pierced, extruded or tapped to your specifications using our new method of semi-permanent dies in conjunction with our quick-process temporary dies.

For detailed information send for literature. For firm quotations and delivery commitments, send us your prints.

# **WLS STAMPING COMPANY**

Short Run Stampings

3296 East 80th Street  
Cleveland 4, Ohio



Jones & Lamson Special Turbine Blade Checking Comparator Equipped with J & L 434 MM. Projection Lens

or working clearance of 12½ inches. A specially designed condensing lens is a part of the equipment.

### Sheldon 10-Inch Bench Lathe

The Sheldon Machine Co., Dept. MMS, 4250 N. Knox Ave., Chicago 41, Ill., announces a 10-inch bench lathe with a 1½-inch hole through the spindle and an integral horizontal motor drive. Additional features include a ¾-inch collet capacity (1-inch collet capacity with nose type collet chuck), tapered roller spindle bearings, double walled worm feed apron

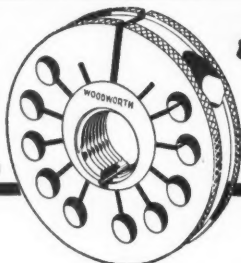
6-inch diameter area and project it at five magnifications on a 30-inch square screen. The lens aperture is 6½ inches in diameter and has a back focal length

clude a ¾-inch collet capacity (1-inch collet capacity with nose type collet chuck), tapered roller spindle bearings, double walled worm feed apron

RED—  
NO GO

GREEN—  
GO

Pat. Pending



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**THREAD  
RING GAGES**

No wonder more and more industries are adopting this gage as standard. Its revolutionary design assures wear life 5 to 7 times longer. And maintains accurate inspection. Just try the Woodworth Thread Ring Gage on your extra tough job—and you, too, will standardize!

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FEATURES**

- 1 Greater accuracy and stability
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**ACCURACY  
YOU CAN TRUST**

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N. A. WOODWORTH CO., SALES DIVISION • 1300 E. NINE MILE ROAD • DETROIT 20, MICHIGAN  
COMPLETE LINE OF PRECISION GAGES • DIAPHRAGM CHUCKS • CONE-LOK JIGS

# 3 HANDEES COVER the FIELD

TOOLS OF 1001 USES GRIND, DRILL, POLISH,  
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For work on  
metals, alloys, wood,  
plastics, stone, horn, bone, etc.  
Plugs in any AC or DC socket.

## HANDEE 44

A good production tool. Has everything — speed, power, versatility and pencil-point precision. Constantly cooled by forced air, the 44 runs cool and smooth all day long. Weighs 2 lbs. 8½" long. 20,000 r.p.m. \$31.50.  
In wood case with accessories \$42.50.

## HANDEE Hi-Power

A big fellow. Fast, powerful, sturdy, for continuous work. Has ample power to drive a 2½" diam. wheel. Weighs 3 lbs. 10" long. 17,000 r.p.m. In case with accessories \$42.50.

## CHICAGO ACCESSORIES

Grinding and mounted wheels, sanders, steel cutters, etc. — the most complete line to fit any power tool — over 500 of finest quality — all made in our own plant.

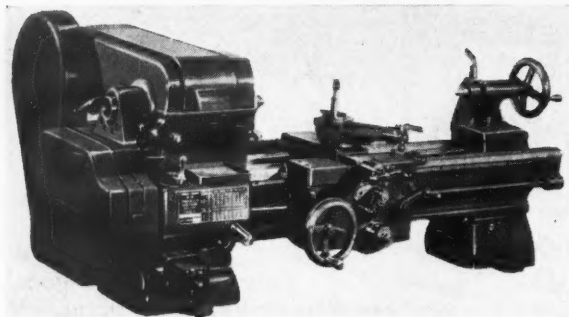
Handee Tools and Accessories are in stock in principal industrial areas. Write for catalog.

## HANDEE

First tool of this type — today's finest. For precision work. Also gets into hard-to-reach places to make machinery repairs. Weighs 12 oz. 6½" long. 25,000 r.p.m. With 7 accessories \$20.50.  
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Sheldon 10-Inch Bench Lathe

Microscope shown here-with has been placed on the market by the George Scherr Co., Inc., 198-A Lafayette St., New York 12, N. Y. The instrument consists of a heavy Meehanite base and post, on which the Meehanite microscope bracket is vertically adjustable by a spiral rack and pinion.

An additional vertical adjustment of the microscope tube within the bracket is provided for greater capacity, particularly when handling work between centers.

The microscope tube provides a standard magnification of 30X for the image of the work. The standard reticule in the eyepiece contains a 90-degree hairline cross and a 60-degree angle cross for thread measurement. To facilitate thread checking, the vertical post with microscope and bracket may be tilted to the helix angle of thread. The work is either

with power cross feed, and full quick-change gearbox that provides a thread cutting range of from 4 to 224 threads per inch. The 4-step V-belt motor drive is designed to accommodate either a  $\frac{1}{2}$  or  $\frac{3}{4}$  h.p. motor.

### Wilder Toolmakers' Microscope

Combined precision and essential features with simplicity and economy of manufacture, the Wilder Toolmakers'

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1/32" to 1/2" Diameter

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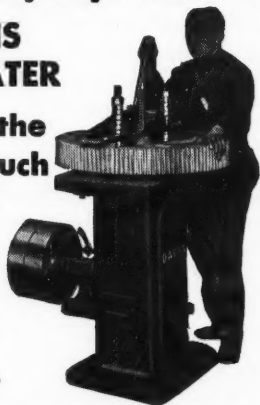
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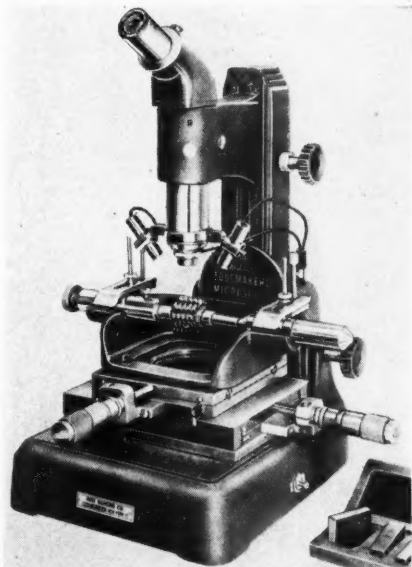
**DAVIS KEYSEATER CO.**

Exchange and Glasgow Sts.  
ROCHESTER, N. Y.



laid on the compound measuring stage or held in a center cradle that attaches to it. Measurements in two directions are obtained by 1-inch heavy type micrometer screws of dull chromium finish that read directly in 0.0005 inch. The design of the stage is such that for highest accuracy, gage blocks may be used in both directions instead of the micrometer screws. Longitudinally, a total range of 2 inches is provided.

As an outstanding feature of the Wilder Toolmakers' Microscope, the stand-



Wilder Toolmakers' Microscope

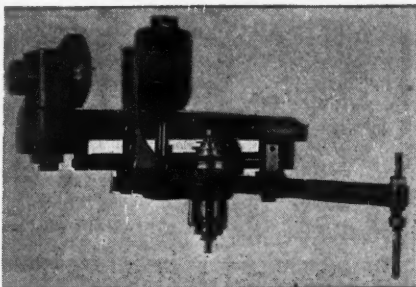
ard equipment incorporates both under-stage illumination for shadow images and surface illumination for reflected images so that any part, regardless of shape or nature can be handled. The image in the eyepiece is produced on a clear glass reticule for a maximum of definition and a high degree of measuring certainty.

### "Burgmaster" Automatic Indexing 6-Spindle Drilling and Tapping Machine

An automatic indexing 6-spindle drilling and tapping machine with six selective spindle speeds is now being produced

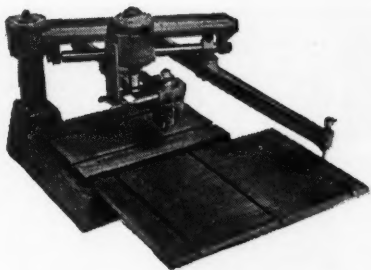
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The attachment that makes your miller a 2 or 3 dimensional profiler, contour miller or engraver.



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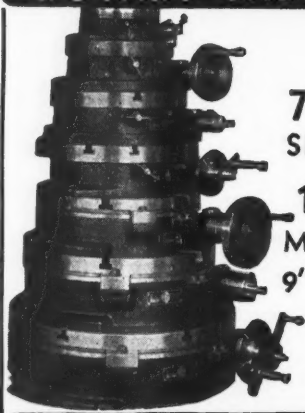
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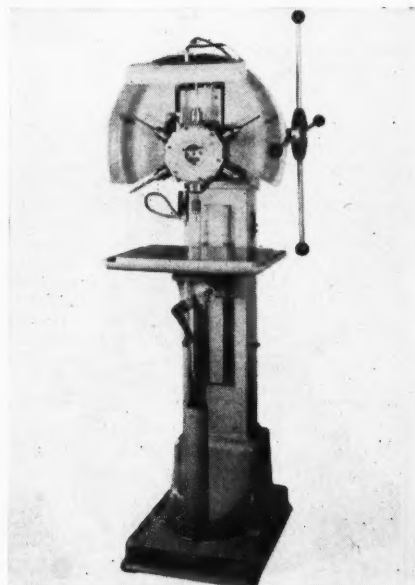


Catalog on request

**TROYKE MFG. CO.**

4122 Appleton St., Cincinnati 9, Ohio

under the trade name of "Burgmaster" by the Burg Tool Manufacturing Co., Dept., MMS, 5028 W. Jefferson Blvd., Los Angeles 16, Calif. According to the manufacturer, six entirely different operations such as center drill, drill, ream, tap, counterbore, countersink, spot-face, recess, and so on, can be performed without moving the part or the operator shifting from the machine. Each tool is brought into operating position by a short



"Burgmaster" Automatic Indexing 6-Spindle Drilling and Tapping Machine

movement of the feed handles and, since each spindle has its own individually set depth stops which index automatically, operation of the machine is claimed to be as simple as with an ordinary drill press.

Accurately made of high grade materials, the Burgmaster 6-Spindle Drilling and Tapping Machine features a  $4\frac{1}{2}$ -inch spindle stroke;  $\frac{1}{2}$ -inch drill and  $\frac{3}{8}$ -inch tap capacity in steel to the center of an  $18\frac{1}{2}$ -inch circle; 6 spindle speeds at one setting ranging from 2,600 to 365 r.p.m. all preselective so that the proper spindle speed is provided for each tool as it indexes into operating position; built-in coolant system and light; jackscrew operated table with  $\frac{1}{2}$ -inch T-slots; and 14 x 18-inch working surface.

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**SPEED PRODUCTION**

**INSURE ACCURACY**

**LOWER TAPPING COSTS**

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See their 5 Big Features below;  
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**SCULLY-JONES CATALOG**  
No. 500. Write for our  
complete listing of sizes.

## 5 BIG FEATURES

Four-Point Bearing  
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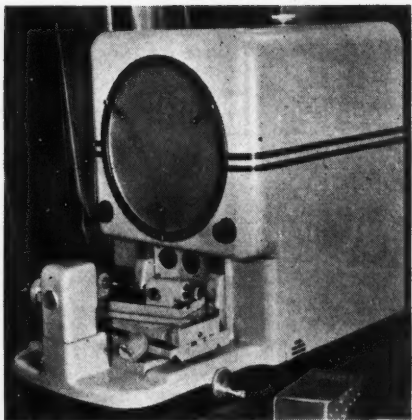
Refer to the Scully-Jones Catalog showing over  
500 types and sizes of cutting tools, collet chucks,  
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**Scully-Jones**  
AND COMPANY

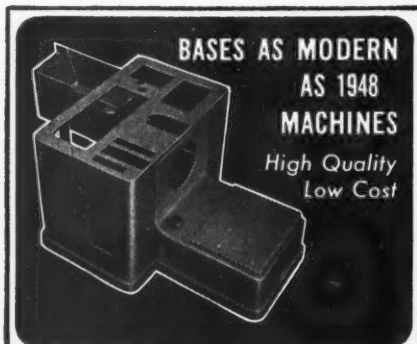
1909 SOUTH ROCKWELL STREET • CHICAGO 8, U. S. A.

## Eastman Kodak Contour Projector

Designed to provide a rapid and accurate means for checking precision parts, a contour projector which can be used without hoods or screens and is said to be particularly suited for mass inspection techniques has been developed by The Eastman Kodak Co., Rochester 4, N. Y. The unit embodies an optical system which provides a constant working distance of 8 inches between the part and the first lens of the projection system. This distance is said to be maintained at



Eastman Kodak Contour Projector



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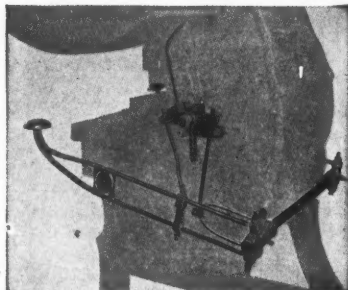
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all magnifications and to afford ample space in which to mount efficient staging fixtures which are interchangeable at different magnifications and, if desired, on different machines. Adequate table motions are provided for conveniently positioning a fixture of almost any size.

Once a part in the fixture is brought into focus at one magnification, no further focusing is said to be required as other magnifications are used. In addition, any selected magnification is claimed to be maintained at all times independent of the focusing operation. Optical distortion is said to be held below measurable limits over the entire magnified area, with the result that all of the desired dimensions can be compared directly on the master chart on the screen.

An additional feature of the Eastman Kodak Contour Projector is an optical unit which provides uniform, brilliant illumination, thus permitting the use of



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Combination Gate and Barrier Guards  
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the instrument in fully lighted rooms without hoods or curtains. To reduce operator eye fatigue when the instrument is in constant use, a rheostat is provided for diminishing light intensity at will. For measuring surface features or sections of an object where the profile is obstructed, such as punches, cavities, or engravings, two powerful auxiliary surface illuminators behind heat-absorbing windows provide a bright image in natural color on the screen. Both a surface image and a profile image can be projected at the same time.

All lenses and mirrors used in the Eastman Kodak Contour Projector are ultra-hard coated by a special process to reduce light loss and increase contrast. The cabinet of the projector, containing the lenses and mirrors, is dust tight and a forced-air cooling system exhausts accumulated heat from the base, away from the work area and the operator. A number of accessories are available for use with the projector, including enclosed surface illuminators; a lens turret which is designed to mount up to five projection lenses of assorted powers to 100X that are indexed simply by turning a knob; a helix table for positioning threaded parts at the proper angle to the light beam so that a normal plane is projected; and an

attachment for the vertical inspection of thin parts where it is more convenient to direct the light through a transparent work support such as a glass table.

## "Versa-Mil" Machine Tool Auxiliary

Known as the "Versa-Mil," a machine tool unit that may be combined with a wide variety of standard machine tools to add the functions of precision milling, drilling, boring, and grinding is now being produced by the Versa-Mil Co., Dept. MMS, 30 Church St., New York 7, N. Y. The unit may be mounted on the compound or carriage of a lathe, for performing such diverse operations as milling keyways, faces, splines, gears, and threads; drilling, reaming, boring, and routing; grinding external and internal, cylindrical, taper, and flat surfaces; and tool grinding. It is adapted for mounting on 12 to 36-inch lathes.

With other machine tools such as planers, boring mills, horizontal millers, and turret lathes, the Versa-Mil is said to eliminate handling time and simplify setup, as the workpiece may be retained on a single machine for a series of oper-

## Adjustable • MULTI-DRILL for Production Drilling

9" DRILLING AREA  
AVAILABLE WITH 2 TO 8 SPINDLES

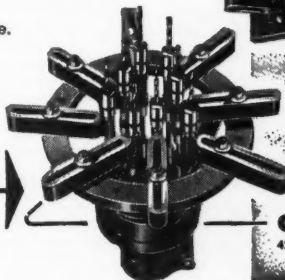
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- Quick, easy adjustments to any hole pattern on or within a 9" circle; 1/2" minimum center distances; Drill sizes 1/8" to 3/8"
- Special adaptations available.

MULTI-DRILLS are made in other sizes and models.

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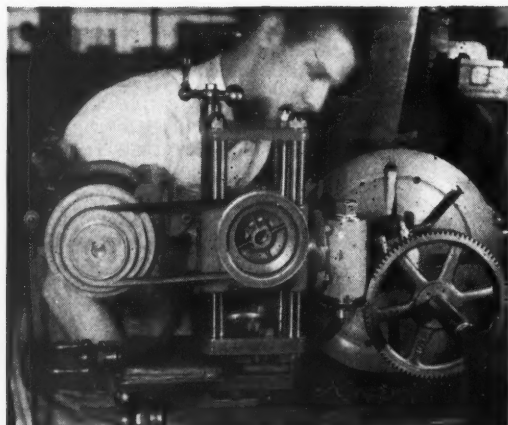
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Milling a Gear on a 16-Inch Lathe  
Using the Versa-Mil

is 16½ inches high, has a steel base 6 x 6¼ inches, and weighs 89 to 104 lb., depending on the motor.

With a ½ h.p. motor, the Versa-Mil is said to mill a ¾ x ¾-inch slot in steel at a rate exceeding 1 inch per minute. Other units can be combined with the power unit for additional machining operations. Interchangeable milling and drilling heads offer speeds up to 5,175 r.p.m. and 360 degrees of angular settings.

Grinder heads adapt the Versa-Mil for cylindrical, surface, and internal grinding and for tool grinding. Grinder speeds range from 4,140 to 13,800 r.p.m.

with capacities from 6 to 1-inch diameter wheels. A dividing head available can be arranged to index lathe spindles for milling gears and splines or positioning work for graduating, indexed drilling, and angular facing.

The Versa-Mil is also designed to serve as a portable machine tool that can be

ations, including milling, boring, and grinding. Wide flexibility is provided in the range of work handled and spindle speeds provided. In its simplest forms, the basic or "power unit," equipped with either a ½ or ¾ h.p. motor, has spindle speeds of 33 to 295 r.p.m. for milling, drilling, boring, and facing. The power unit



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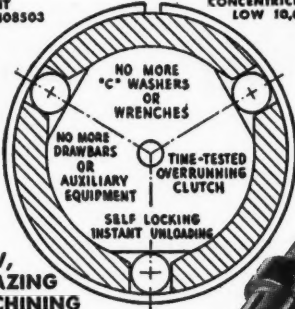
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attachments. This adaptability on-the-job means worthwhile savings for you.

Snap-on tools are available through 40 direct factory branches located in key industrial areas. Write for address of Snap-on branch nearest you.



**SNAP-ON TOOLS CORPORATION**

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Surface Grinding on a Horizontal Miller Equipped with the Versa-Mil

ing the Versa-Mil on machinery or work surfaces. Keyways and faces can be milled, holes drilled and bored, and shafts and flat surfaces ground without the necessity of disassembly and moving the work into a machine shop.

The Versa-Mil is built to close precision machine tool standards, incorporating micrometer lead screws, high precision bearings, hardened and ground steel wearing parts, and oil seals for the protection of moving parts from abrasives and coolants.

readily taken to large, heavy, or stationary work. A feed table, or auxiliary base, available incorporates longitudinal and cross feeds, with micrometer lead screws, and provides a means for rigidly mount-

### Globe Automatic Small Field Coil Winder

A high speed turret type automatic winding machine for the winding of single field coils at an automatic high

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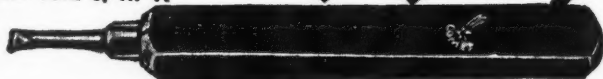
**THE CINCINNATI GEAR CO.**  
Wooster Pike Cincinnati, Ohio



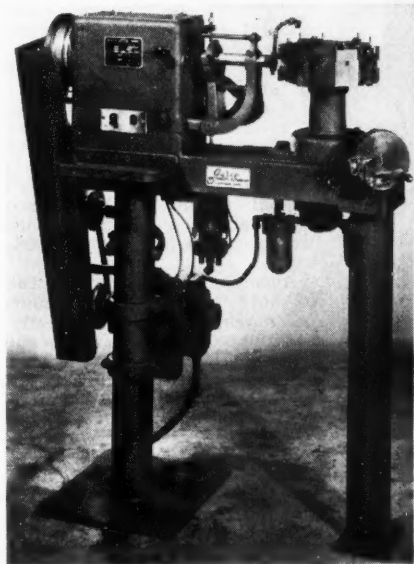
### INTERNAL THREADING AND BORING TOOLS

For holes from 1/8" upwards, 15 different sizes. The accurate thread angle is maintained through each sharpening until tool is entirely worn down. Small head-long cutting surface for regrounding.

**COMET TOOL CO.**  
738 B'way., New York 3, N. Y.



rate of production is announced by The Globe Tool & Engineering Co., 425 Davis Ave., Dayton 3, Ohio. In use, the operator merely picks coils off of the winding form at the unloading station of the turret using a suitable flat spring clamp, and then touches a button which brings the next station up for unloading. The coil is automatically unlocked when approaching the unloading station and the form is automatically locked when leaving the



Globe Automatic Small Field Coil Winder

station. The machine automatically starts when a form is indexed to the winding station.

According to the manufacturer, from 5 to 10 coils per minute may be produced by one operator when using the Globe Automatic Small Field Coil Winder to its maximum utility.

### Verson Gang Press

To bridge the gap between press brakes and large heavy blanking presses, The Verson Allsteel Press Co., 1355 E. 93rd St., Chicago 19, Ill., has developed a gang press which is available in tonnage capacities ranging from 100 to 350 tons and in bed lengths from 72 inches up. The press is said to be especially design-

Use the right blade

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Star makes blades for cutting everything a hack saw or band saw can cut — a complete line. That's why your Star supplier can tell you — quickly, expertly — what Star Blade will do your job best!

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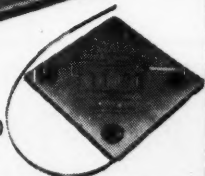
### ★ POWER BLADES



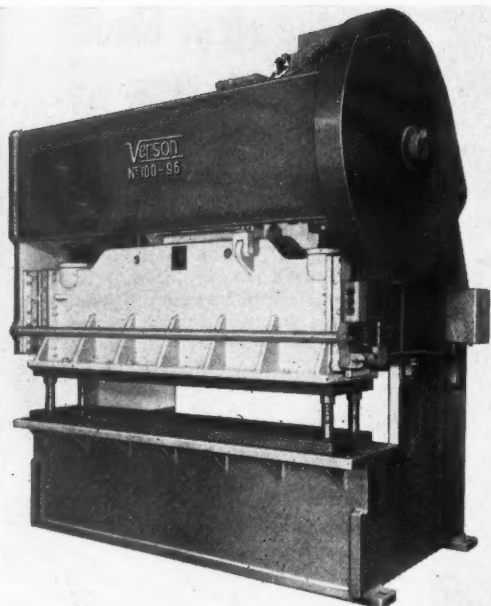
### ★ FRAMES



### ★ BAND SAWS (including skip-tooth) (metal and wood cutting)



## Verson Gang Press



ed for blanking, forming, punching, shallow drawing, and multiple operations whereby a series of operations may be performed with one setup. Control of the machine is effected by means of electrical push buttons—hand or foot operated—and a selector panel for inching, one-stroke, or continuous operation.

## Neehi Industrial Marking Inks

Neehi Protective Coatings Inc., Ink Division, 340 W. Hoffman Ave., Lindenhurst, N. Y., announces two complete

lines of fast-drying marking inks for machine or manual marking on any types of surfaces, including asphalt or creosoted surfaces. The machine marking inks are available in a wide range of colors and are especially designed for automatic, semi-automatic, and manual marking devices using rubber or steel type. The inks may be fed to the type by felt or metal rollers or both.

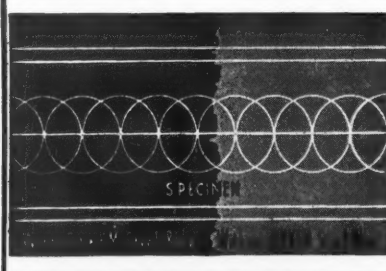
The manual marking inks are available in a wide range of colors for free-hand marking, stenciling, or spraying, and may be used with a marking brush, stencil brush, or spray gun. They can also be thinned for use with a pen point for fine markings.

According to the manufacturer, both the machine and manual marking inks are fast-drying and can be regulated to suit marking conditions and production schedules. They are said to be waterproof, weatherproof, fade resisting, oil, solvent, acid and alkali resisting, and to withstand severe handling.

Neehi Industrial Inks are claimed to be especially designed for color code and specification marking on metal, wood, paper, and numerous other materials.

## Diamond 56-Ton Back-Geared Punch Press

The Diamond Machine Tool Co., Dept. MMS, Los Angeles, Calif., announces the addition to its line of punch presses of a 56-ton capacity model with back gear-



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1/16" to 1/4"  
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All Super Twist Drills are shipped with complete instructions on recommended applications, speeds and feeds.

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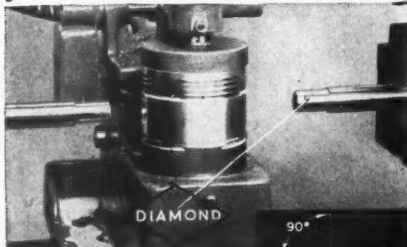
*Carbide Tools*

## **SUPER TOOL COMPANY**

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## GILMORE DIAMOND BORING TOOLS



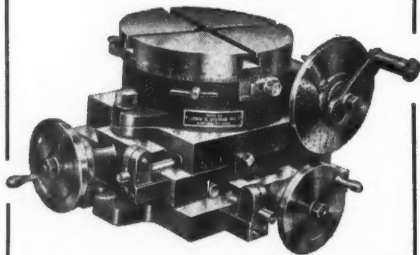
The diamonds in these tools are carefully chosen under strong magnification to make certain they have inherent qualities that render long boring service. • Write for data book on diamonds for Turning, Boring, Testing.



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## No. 1 COMPOUND TABLE With 7 1/2" Dial Type Rotary Table Mounted



We also make a No. 2 Size for 12" Rotary Table. Can be had without Rotary Table.

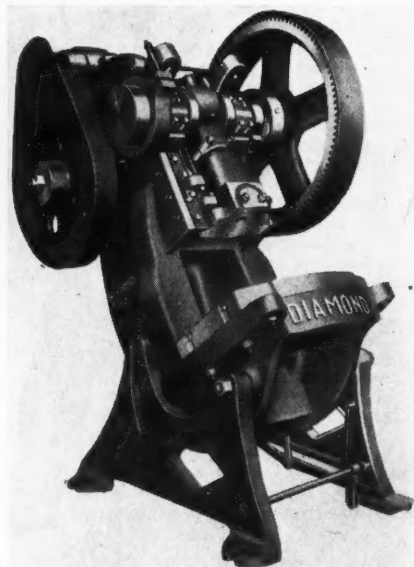
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Rotary Tables • Multiple Spindle Index  
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482 Canal St.

New York 13, N. Y.

ing that provides for a slow stroke with heavy punching tonnage. The machine is designed to strain gage analysis to equalize stresses uniformly throughout the frame, which is cradle mounted and may be inclined up to 35 deg. The ratchet feed arrangement operates on thrust ball bearings by means of a square threaded screw. Inclining or raising of the frame can be conveniently effected from either the front or rear of the press by one work-



Diamond 56-Ton Back-Geared Punch Press

er, and is said to require 8 minutes' operation.

An outstanding feature of the Diamond 56-Ton Back-Geared Punch Press is the foolproof non-repeat trip mechanism which is said to be simple both in design and operation yet positive in action. Engagement of the flywheel occurs in any one of the three positions during a single revolution, making action almost instantaneous. A nickel-molybdenum steel clutch dog is fully supported within the thick crankshaft collar. Its extra length, together with its large cross section-area and double heat treatment, is said to eliminate clutch fatigue failures resulting from heavy shear and shock loads.

Specifications of the press are as follows: shut die height, 16 inches; stand-



### Johnson Model "B" Metal Cut-Off Band Saw

ard stroke, 3 inches; maximum stroke to order, 8 inches; bed area, 21 x 30 inches; strokes per minute, 50; and degree of inclination, 35 degrees.

### Johnson Model "B" Metal Cut-Off Band Saw

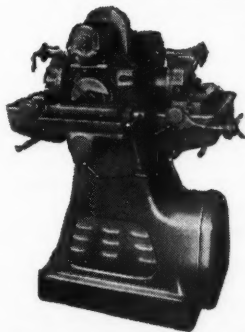
A small horizontal metal cut-off band saw designated as the Model "B" is now being introduced by the Johnson Manufacturing Corp., Room 642, Chrysler Bldg., New York 17, N. Y. The machine is of sturdy construction and is designed to cut off metals up to 5 x 10 inches.

Features of the machine include a rigid box type frame with the wheel assemblies mounted high on welded steel brackets bolted high on the frame. The bed is 7 inches wide x 28 inches long and is set on a three-point base to ensure that the



saw is always supported free of torsional strain and the accuracy unaffected by floor conditions. An improved hydraulic control is built into the machine to provide correct feed for every section, and a stock stop gage is supplied for duplicate cutting.

## HOW TO GRIND CARBIDE CUTTING TOOL BITS ECONOMICALLY



### Here's tool grinding at its best!

Employing 3-step progression—rough, semi-finish, and finish or hone—on one machine, this LeMaire 3-Wheel Grinder produces keener edge in fraction of time. Because tools go to diamond wheels in better condition, life of diamond wheels is considerably lengthened. Both labor and wheel costs are reduced—time is saved—production is increased.

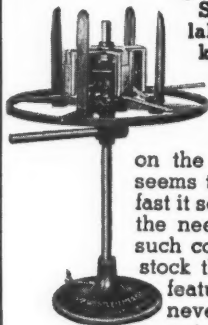
Wouldn't you like to know more about this remarkable 3-Wheel Grinder? Send for descriptive folder.

**LeMaire Tool & Mfg. Co.** 2657 S. Telegraph Road  
Dearborn, Michigan

Designers and builders of unit and way type machines for single or multiple spindle drilling, boring, reaming, tapping, etc.—Twin Ram Hydraulic Units—Match-It Gear Chucks.

All controls of the Johnson Model B Metal Cut-Off Band Saw are located within easy reach of the operator, and the wheels are fully guarded to ensure safety. The machine is arranged to operate and shut off automatically. Designed for easy operation by inexperienced workers, the machine is provided with three blade speeds of 45, 90, and 150 feet per minute for cutting a wide variety of material thicknesses. Readily portable, the unit has a net weight of 235 lb. and can be easily taken from job to job when necessary. Casters are available as optional equipment.

## WESTLEN *Adjustable Self Centering* REELS



**Saves time, saves labor, saves trouble, keeps costs down.**

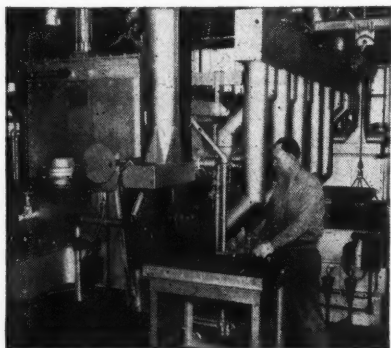
This smooth-running, ball-bearing thrust reel is so quick and easy on the draw it actually seems to have brains; so fast it seems to anticipate the needs; yet it retains such complete control of stock through its special features that stock never "gets away" or out of control.

Write us  
for  
details  
today

**The RULETA Co.**  
27 WARREN ST. NEW YORK 7,

## Westinghouse Gas Fired Furnace

A gas fired furnace for annealing, carburizing, drawing, hardening, spheroidizing, malleablizing, normalizing, and dry



Westinghouse Pusher Type Gas Fired Furnace for Gas Carburizing or Bright Hardening of Carbon and Alloy Steel Parts

cyaniding is now being marketed by the Westinghouse Electric Corp., Box 868, Pittsburgh 30, Pennsylvania.

Designed for use with separately prepared protective atmospheres such as Exogas, Endogas, Monogas, or Armogas, the furnace is available in cylindrical bell types for the bright annealing of copper wire in coils and in reels, of steel wire or strip, and other applications such as spheroidizing or drawing; continuous pusher types for annealing, gas carburizing, hardening, and malleablizing; continuous roller hearth types for applications such as cycle annealing, hardening, malleablizing, and drawing; and continuous conveyor types for heat-treating applications where light and medium weight parts are involved.



## You NEED these TWO Machines

- The MILWAUKEE DIE FILER for straight-line, sharp-corner filing, sawing and lapping.
- The MILWAUKEE PROFILE GRINDER for high speed, precision grinding of curved and irregular contours.

**RICE PUMP & MACHINE CO.**  
Division of Milwaukee Chaplet & Mfg. Co.  
1041 S. 40th ST. MILWAUKEE 4, WIS.



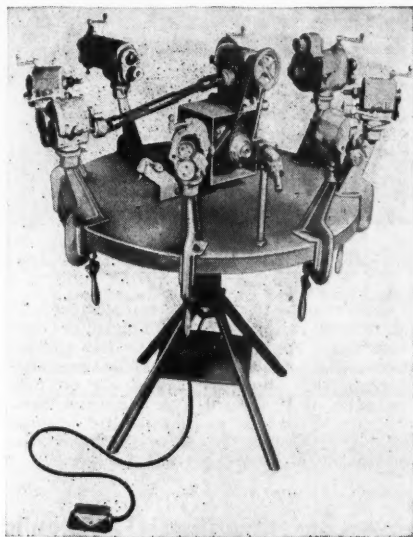
**MILWAUKEE**

**DIE FILERS  
PROFILE GRINDERS**

Write for  
Bulletins

### Roto-Table

Designed to provide central power for a variety of hand-cranked tools and machines, the Roto-Table shown herewith is now being offered by the Roto-Table Co., 2605 E. Third St., Dayton 3, Ohio. Constructed to occupy a minimum of space, the unit, although developed primarily for sheet metal shops, can also be used successfully in machine shops and various other types of shops.



Roto-Table

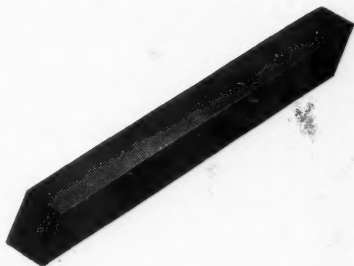
Forty-two inches in diameter, the table rotates around a central shaft to which is attached an electric motor-driven gearbox. A spring-loaded arm having universal joints and sockets at each end connects the drive unit with the machines mounted around the rim of the table. Three speed ranges are provided through V-belts, and a foot switch is used to control both forward and reverse motion.

Two seconds is the time that is said to be required to connect or disconnect the power arm drive unit or any of the driven tools and machines. The table rotates to permit powering of a number of devices in any production sequence and is said to provide a working space equivalent to a 24-inch x 27-foot stationary table.

# Spartan

Announces

## SPAR-KING TOOL BITS



Spar-King (High Speed) is an intermediary line of tool bits, coming between our Kutall and Sparground lines.

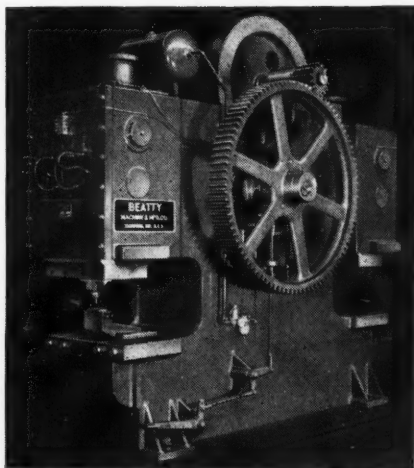
Spartan now has available for you a complete well-rounded line of tool bits for every purpose.

**ASK YOUR DISTRIBUTOR TODAY.**

**SPARTAN SAW WORKS, INC.**  
SPRINGFIELD, MASS.

## Beatty Improved No. 9 Double End Punch

Improvements in the construction of its No. 9 double end punch press designed for structural fabrication shops, railroad shops, tank shops, implement manufacturers, and so on, are announced by the Beatty Machine & Manufacturing Co., Dept. MMS, Hammond, Ind. The improved unit, in addition to providing a shorter distance between punching centers than previously (9 feet instead of 12 feet), also utilizes a welded steel construction in place of the former cast construction.



Beatty Improved No. 9 Double End Punch

According to the manufacturer, the shortened machine is more rigid, occupies less floor space, and better fits production-line requirements. Featured are centralized lubrication and air counter-balance of the ram. The machine has a 24-inch throat at each end and includes an architectural table with front filler block for converting to a plain table.

## Lyon-Raymond Special Hydraulic Elevating Table

An interesting and unique adaptation of its standard hydraulic elevating table has been announced by Lyon-Raymond Corp., 5427 Madison Ave., Greene, New York.

Designed to provide an accurate posi-

*High Speed*  
**COUNTERBORES**  
**BACK**  
**SPOT**  
**FACERS**  
•  
Interchangeable  
•  
*Catalog*  
*on*  
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**BICKNELL-THOMAS COMPANY**  
Greenfield . Massachusetts



**SCHULTZ & ANDERSON**  
*dowel pins*



## Immediate Delivery!

Standard Size Dowel Pins from  $\frac{1}{8}$ " to 1" diameter and from  $\frac{3}{4}$ " to 6" length supplied in .0002 and .001 over basic sizes. Unless otherwise specified, .0002 oversize will be furnished.

*Dealer inquiries invited.*

**SCHULTZ & ANDERSON CO.**

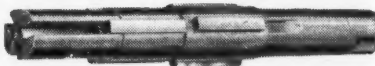
111 EDISON PLACE NEWARK 5, N. J.

# FIGURE THE TIME YOU SAVE

with **Nicholson**  
**EXPANDING MANDRELS**



Set of 14 does the work of 209 solid arborers. Not infrequently, time studies show operations are completed



**TYPE A**—Step jaw design. Especially adapted for holding work with short bores; for hexagonal broached holes as well as round.

In less time than was formerly consumed in looking for or turning a solid arbor. For all bores  $\frac{1}{2}$ " to 7". Hardened tool steel. Sold singly or in sets. Used in shops the nation over. Test the time-saving possibilities of these precision tools in turning, milling, grinding. **BULLETIN 1043.**

**W. H. NICHOLSON & CO.**

136 Oregon St., Wilkes-Barre, Pa.

## Solved! The Problem of Oversize and Bell-Mouthed Holes!

When you get exasperated over tapping and reaming jobs coming through with oversize and bell-mouthed holes, remember this! The Ziegler Floating Holder has solved this problem for others. Why not let it do the same for you?

In most cases the trouble is not the fault of the machine or the tool but is caused by the work not being properly aligned with the spindle.

This can be easily remedied by the Ziegler Holder because it automatically compensates for inaccuracies in alignment up to  $\frac{1}{32}$ " radius or  $\frac{1}{16}$ " diameter.

Get a Ziegler Holder and see what a difference it will make in the precision of the work performed.



Types to fit any machine used for tapping or reaming.



**FLOATING HOLDER**  
for Taps and Reamers...

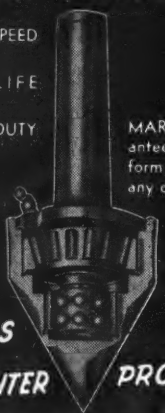
**W. M. ZIEGLER TOOL CO.**

1928 TWELFTH ST.  
DETROIT 16, MICH.

• **WRITE FOR CATALOG** •

## MARVECO LIVE CENTERS

- HIGH SPEED
- LONG LIFE
- HEAVY DUTY

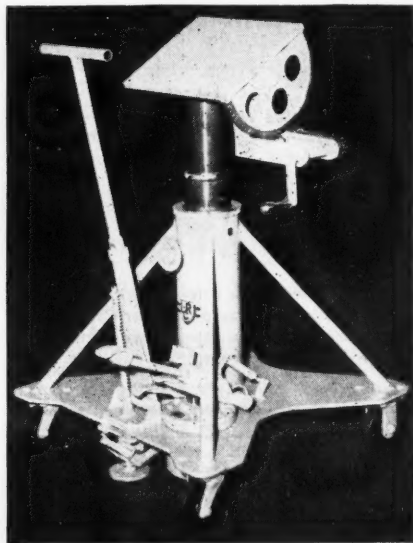


MARVECO - guaranteed to outperform and outlast any other live center. Write for free catalog, "The Marvels of Marveco."

SEND US  
YOUR CENTER PROBLEMS

**MARVEL TOOL & MACHINE CO.**  
3401 E. McNichols Road, Detroit 12, Mich.

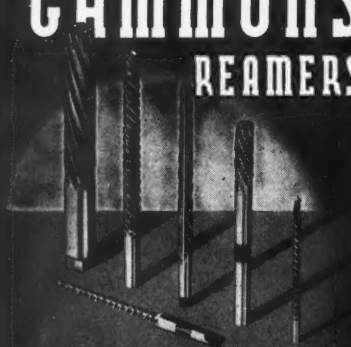
tioning device for a special drilling tool, the unit comprises a standard model table with telescopic cylinder which affords a range of elevation from 28-inch lowered height to 50-inch elevated height. The special hinged mounting bracket can be adjusted 45 degrees above and below horizontal by means of a hand-operated worm and gear segment mechanism. The unit is equipped with rubber-tired wheels.



Lyon-Raymond Special Hydraulic Elevating Table

Optional extra equipment for the special table includes a two-speed hydraulic foot pump and telescopic towing handle.

## GAMMONS REAMERS



Manufacturers of

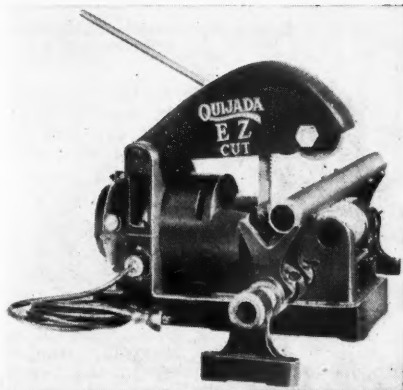
The Gammons Helical Tap & Reamer  
The Gammons Helical Chucking Reamer  
The Gammons Helical Die & Wrench Reamer  
The Gammons Double Tap & Reamer  
Special reaming problems involving

**THE GAMMONS-HOAGLUND CO.**  
MANCHESTER CONNECTICUT

## Quijada "E-Z Cut" Pipe and Tube Cutter

Power-driven rollers, automatic stop-start action, and ball-bearing operation throughout are features of the high speed pipe and tube cutter now being manufactured by the Quijada Tool Co., Inc., 5474 Alhambra Ave., Los Angeles 32, Calif. Compact in design, this fully portable machine, which is known as the "E-Z Cut," is said to simplify and speed up pipe and tube cutting operations in pipe diameters ranging from  $\frac{3}{8}$  to 4 inches. The cutting of cast iron pipe





Quijada "E-Z Cut" Pipe and Tube Cutter

within the same range is also possible with the cutter, which includes a ball-bearing mounted cutter wheel that is easily removable for sharpening.

An integrally-mounted  $\frac{1}{2}$  h.p. 110-volt universal type a.c.-d.c. motor provides

direct gear drive to the rollers. Gears are self-lubricating. An automatic trip-switch initiates the cutting operation when the cutter wheel contacts the pipe and automatically stops the machine when the cut is completed. Adjustable roller yokes provide necessary support for the pipe, yet permit free rotation.

The Quijada E-Z Cut Pipe and Tube Cutter is furnished with 10 feet of electric cord and with twist lock plug to the motor.

### Acme Die Polishing Service

Inauguration of a precision polishing service that is said to provide dies with a flawless super-finish which is extremely durable is announced by the Acme Scientific Co., Dept. MMS, 1450 W. Randolph St., Chicago 7, Ill. In normal use, dies provided with the super-polish are claimed to yield accurately surfaced castings after more than 100,000 impressions. It is further stated that because the highly perfected finish is imparted to the castings themselves, buffing time on the castings is reduced as much as 50 per cent.



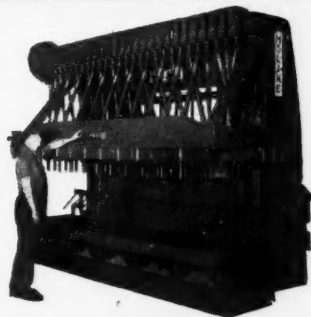
- ★ At greater Man-Hour SAVINGS
- ★ At higher rated EFFICIENCY
- ★ At finer, effortless PRECISION

A Moline Multiple Spindle Specially Designed Machine Tool can do your job better at less cost. Ruggedly built to fit your **INDIVIDUAL** requirements in such operations as Boring—Straight Line Drilling—Universal Adjustable Spindle Drilling—Honing—Tapping—Reaming—Counterboring—Special Milling—these machines are based on years of experience accumulated since 1901.

For your **SPECIAL** problem go "Hole-Hog" and write us for any information you may need.



No. HU68 DRILLER



## MOLINE TOOL COMPANY

100 20th Street

Moline, Illinois



### Palmer-Shile All-Steel Skid with End Racks

An all-steel skid with end racks, especially designed for handling heavy loads with ease and safety, has been developed by the Palmer-Shile Co., 16022 Fullerton Ave., Detroit 27, Mich. Built of heavy gauge corrugated steel with sturdy angle iron legs that provide ample clearance for fork lift or hand-operated trucks, the skid is equipped with removable type end racks to facilitate loading and unloading.

### Palmer-Shile All-Steel Skid with End Racks

Claimed to be excellent for handling hot metal parts, the unit can also be built with a ventilated bottom.

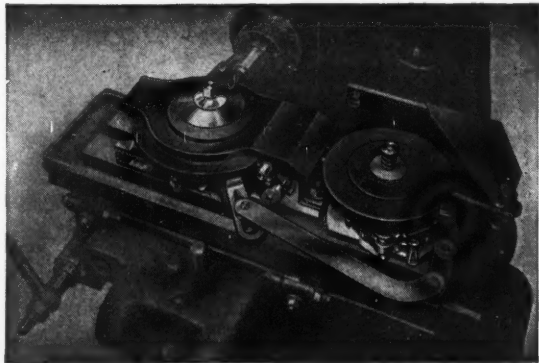
### Bryant Air Impact Hammer

"Exploded air," a recent development in air mechanics, is said to make possible the production of a 1-oz. to 12,000-lb. impact with 100-lb. line pressure in the bench type production hammer illustrated herewith, product of the Bryant Products Distributing Co., 297 W. Michigan Ave., Jackson, Mich. With the hammer, air under high compression is equalized on both sides of the piston. The air below the piston is then suddenly exhausted, thus resulting in an unusual blow.

According to the manufacturer, the Bryant Air Impact Hammer is ideal for light stamping, and forging, trimming, molding, crimping, coining, riveting, piercing, staking, and forming various

## MAXIMUM PRODUCTION IN CHUCKING AND INDEXING

With the new Dearborn Automatic Indexer connected to a Dearborn Chucking Fixture: chuck is closed automatically; indexed the required number of times automatically; chuck is opened automatically; piece is knocked out automatically.



Write for further information.

When used with the Dearborn Degree Indexing Fixture it can quickly be set to index any number of degrees from 30° to 90° at one indexing and then knock out, or it can be set to index from no degrees to 90° and then not knock out.

**J. W. DEARBORN**

**Ansonia, Conn.**

## USE ECONOMY

Headless  
Set  
Screws



Socket  
Set Screws

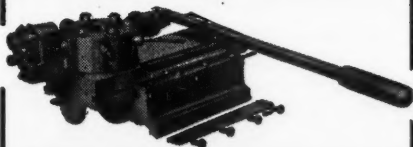


*Try Them On Your Next Job!*

**ECONOMY  
MACHINE PRODUCTS  
COMPANY**

5212 Lawrence Ave., Chicago 30, Ill.

## MORE PROFITS FROM YOUR LATHE



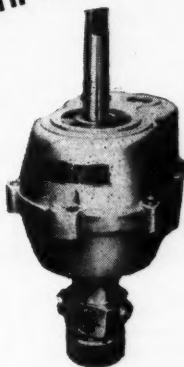
### STEP UP PRODUCTION

INSTALL a Newton Precision Bed Turret for maximum tooling on your Logan, Atlas or Craftsman Lathe. This self-indexing, self-headlocking turret accommodates six tool positions. Adjustable gibs assure long-life and precision operation. Fast — smooth — easy to operate. Get greater production now — **PRICE** Write for free literature now. **\$150.00** Dept. MM-5.....

F.O.B. Los Angeles

**A-K TOOL COMPANY**  
2029 Blake Avenue, Los Angeles, Calif.

**Now—  
YOU CAN DO  
HIGH SPEED TAPPING  
WITH LARGE TAPS!**



**THE NEW ETTCO #5-B  
TAPPING ATTACHMENT**

This newly developed tapping attachment handles taps up to 1" on any heavy duty drill press with the high speeds, sensitivity and accuracy of smaller attachments. An efficient air cooling system insures longer continuous operation without overheating. Its improved clutch insures good clean threads and provides protection against broken taps.

**WRITE FOR DETAILS**

**ETTCO TOOL CO.**

598 Johnson Ave,  
Boston, Massachusetts  
Detroit, Michigan

Brooklyn 6, N. Y.  
Portland, Connecticut  
Chicago, Illinois

materials. The stroke of the unit is claimed to be constant and the impact pressure may be varied precisely up to the capacity of the unit, the impact pressure then remaining the same at any point along the stroke and thus eliminating breakdowns due to variation in stock thickness or to improper positioning. The cushion of air behind the hammer takes up shock, the stroke then accommodating offsize pieces without damage to the work, dies, or press, it is claimed.

The housing and base of the Bryant Air Impact Hammer consist of precision machined semi-steel castings. The col-

umn is seamless steel tubing which is ground on the outside diameter. All moving parts subject to wear are hard chrome plated. The hammer, which can be readily attached to any  $\frac{1}{4}$ -inch pipe connection, has a bench height of 27 inches and area of  $6\frac{1}{2} \times 11$  inches. The maximum stroke of the unit is 3 inches, and the distance from the ram to the column is  $3\frac{1}{4}$  inches. The distance between the ram and the base with 26-inch column is 10 inches.

The power unit of the hammer may be adjusted up or down the column and is readily replaceable. The speed of operation of the hammer by hand or foot control is approximately 60 strokes per minute. Fully automatic operation can be easily effected with the addition of a solenoid valve and guide-rod switches.



Bryant Air Impact Hammer

## Use the RIGHT TOOL for the Job



The RIGHT TOOL for removing a broken tap is a WALTON TAP EXTRACTOR. This specialized tool has paid for itself time and time again, throughout the metal working industry, in both time saved and pieces salvaged. It will pay you to keep your crib stocked with a full set of Walton Extractors.

Learn about Waltons at our expense. Write for folder No. 10 and full details about our 30 Day Free Trial Offer.

**THE WALTON COMPANY**  
HARTFORD 10, CONNECTICUT

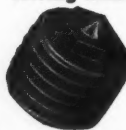
## Pines Semi-Automatic Tube Deburring Machine

The Pines Engineering Co., Dept. MMS, Aurora, Ill., is now offering a high production, manually operated, bench type tube and rod finishing machine for deburring, inside and outside chamfering,



## A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in  $\frac{1}{8}$ " to 1" diameters. Send for price list.

**HEIMANN MFG. CO.**

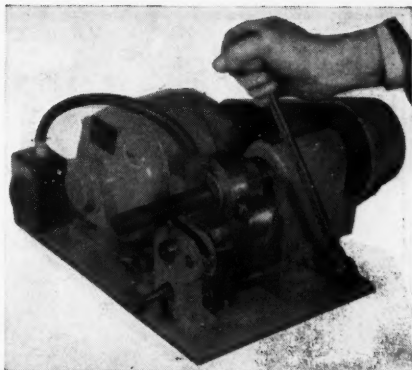
330 Lincoln Ave.

Urbana, Ohio

facing, center drilling, flaring, beading, drilling, reaming, and single-point boring on tubes and rods. The machine design embodies a mechanical chuck and chuck closing mechanism which is said to positively hold any length of tube, pipe, or rod up to 2 inches in diameter. With the work firmly held, deburring, chamfering, and facing operations can be completed separately or simultaneously in a single pass of the machine.

Work clamping is accomplished automatically by closing the chuck jaws, which are equipped with a split type insert to fit individual tube or rod diameter. Controlled clamping pressure of the insert against the outer wall of the workpiece is said to prevent distortion and marring. Chuck inserts are available for any diameter tube or rod within the 2-inch range, or the inserts may be modified to accommodate short pieces, as well as bent and unusual shaped work sections.

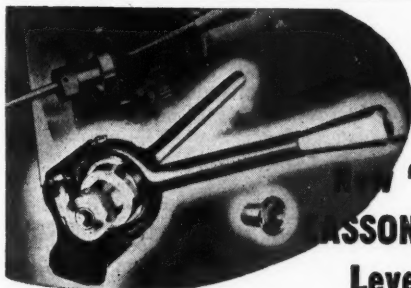
According to the manufacturer, the changing of cutting tools to perform different operations and the changing of inserts to accommodate various work diameters requires approximately one minute. Chuck inserts are held in place by thumbscrews. The toolholder is slotted to accommodate three cutters, which are



Pines Semi-Automatic Tube Deburring Machine

adjustable and may be easily set to compensate for different wall thicknesses. The holder has a threaded shank which screws into the machine spindle, and also has a tapered recess to receive the matching taper of the toolholder body.

The machine is operated by placing the tube or rod through the self-centering chuck against a stop where it is held in



## Discover the advantages of 3-POSITION Tension Adjustment!

"GK" Series  
**KASSON Precision**  
Lever-Type Drawbar

For ATLAS  
LOGAN-SOUTH-  
BEND 9" Lathes

**POSITIVE GRIP . . .** An easy push of lever adjusts to compensating positions for undersize, oversize, or standard diameter work. AND NO FINGERS! Patented co-ordinate cam principle eliminates them. Result is design simplification and fewer parts to wear out. Inquire about 10-day FREE TRIAL OFFER!



A million KASSON PRECISION lathe collets permitted machines to turn during the war . . . They HAD to be right — for accuracy, for fit, for longer life. Unconditionally guaranteed, of course.

**IMMEDIATE DELIVERY!** Ask your distributor for KASSON PRECISION collets and lathe attachments. WRITE US FOR LITERATURE.

**KLUTCH - KOLLETS** are mighty handy too. For accurate chucking work to 2 3/4" diameter, at very low cost. Soft head for easy boring. Fit standard adapters for 3AT, 3C, 1A, 5C, collets.



**GENERAL DIE AND STAMPING COMPANY**  
264 Mott Street - New York 12, N. Y.

## SPEEDMILLER

### Universal Milling Heads



Cuts the Cost  
of Milling, Bor-  
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ing, all angles.  
Adaptable to all  
Milling Machines.

More Powerful Drive.  
6 speeds, 350 to 3000.  
Heavier Spindle.  
S-K-F Precision Bearings.  
Full Swiveling Both Planes.

### NEW LOW PRICES

#### SPEEDMILLER Jr.

for Overarms  
2 1/4" to 3 1/2".  
No. 7 B & S Spindle.  
Collet Capacity 1/2".

only **\$195.**

#### SPEEDMILLER Sr.

for Overarms  
3 1/4" to 5".  
No. 3 Morse Spindle.  
Collet Capacity 3/4".

only **\$295.**

Parts and Collets for all HALCO Heads  
Quick Delivery—Order NOW!

**Veet** Manufacturing Co.  
EAST DETROIT MICHIGAN

place until the operator moves the hand feed lever to the left. This operation, in turn, provides for closing of the chuck and feeding of the tube end toward the cutter. Progressive forward movement causes the stop to swing away from the work, thus clearing the tube end for the machining operation.

The depth of cut is predetermined by means of an adjustable screw type stop which accurately gages the amount of feed and the stock removed. After the tube end has been machined, the operator reverses the lever movement, thus causing the chuck assembly to return to its original position and providing for unclamping of the work. The machine is completely controlled through the single feed lever, thereby leaving one hand free to handle the stock.

Outstanding mechanical features of the Pines Semi-Automatic Tube Deburring Machine include a hardened and ground spindle mounted in preloaded grease-sealed anti-friction ball bearings. The spindle housing is said to be of sufficient size and weight to rigidly support the spindle during machining operations. All integral parts in the machine are finished to precision limits. The chuck is bored in two places to assure concentricity and alignment with the spindle. Two V-belts are used for driving purposes, the belts being well guarded. The complete unit is assembled on a common base plate and is said to require a minimum of bench space when in operation. The light weight of the machine enables it to be moved without difficulty.

### Mid-States A.C. Arc Welder

A high-cycle a.c. arc welder for heavy duty industrial use has been announced by the Mid-States Equipment Corp., 2439 S. Michigan Ave., Chicago 16, Ill. Available in two models with 200 and 300-ampere output respectively, the unit features a unique precision electrical circuit which is said to maintain the welding arc constant with selective heat settings in one-ampere steps through a special air-cooled induction type transformer.

The high frequency circuit with remote feather-touch control at the electrode holder used in conjunction with the Mid-States A.C. Arc Welder is said to be specially designed for electronic fluxing and oxide dispersal requirements of the new arc processes, such as inert gas shielded arc welding and "Heliarc" process. Of particular importance is the fact that the remote control of the high



## Why a *Commander* Tapper?

- **Tapping capacity** 0 to  $\frac{3}{4}$ " with one tapper.
- **Torque control**—may be adjusted to protect any size tap. This assures safe bottom-hole tapping.
- **Spring clutch** drive eliminates slippage and wear . . . provides smooth, quiet, positive operation.
- **Compactly built**—affords maximum visibility of tapping operation.
- **Furnished to fit any Drill Press.**



**One COMMANDER  
TAPPER handles  
the range #0 to  $\frac{3}{4}$ "**

*Write for circular and name  
of your nearest Distributor.*

**COMMANDER MFG. CO.**

4224 W. Kinzie Street Chicago 24, Ill.

Product of *Commander* . . . Builder of the *Multi-Drill*

## KEEP YOUR TOOLS HANDY...



Fig. 1855

**HALLOWELL  
MOVABLE**

## Tool Stands of Steel

These "Hallowell" Tool Stands—built of sturdy steel, welded throughout, and equipped with free-rolling casters—enable you to keep your tools with you as you move from job-to-job. They provide long, trouble-free service . . . and the steel drawers, as shown, can be locked to prevent tool absenteelisms. They are available with two drawers as illustrated . . . with one drawer . . . or without drawers, depending on your needs. Ask for the "Hallowell" Catalog.

**Write us for the name and address of your  
nearest "Hallowell" Industrial Distributor.**

**OVER 45 YEARS IN BUSINESS**

**STANDARD PRESSED STEEL CO.**

JENKINTOWN, PA., Box 556 • Branches: Boston, Chicago, Detroit, Indianapolis, St. Louis, San Francisco



Mid-States A.C. Arc Welder

frequency circuit is said to virtually eliminate all radio interference.

According to the manufacturer, the

Mid-States A.C. Arc Welder, which has no moving parts, is unusually rugged in construction and is designed for maximum efficiency with minimum maintenance.

### Flexrock M.F.P. Machine Shop Floor Patch

Identified as Flexrock M.F.P., a machine shop floor patch which, it is claimed, offers extremely high resistance to oil and grease, is shockproof, and provides a maximum of foot-ease and light reflection is now being marketed by the Flexrock Co., Dept. MMS, Filbert & Cuthbert Sts., Philadelphia 4, Pa. Said to require only 1/2 inch "chip out" around the edges, the material can be quickly and easily applied over concrete or wood and is of the same color as concrete.

In addition to its shatterproof properties, Flexrock M.F.P. has a surface hardness and smoothness which are claimed to reduce load-drag to a minimum. The material is supplied as a complete unit and can be effectively applied merely by following the simple directions provided.

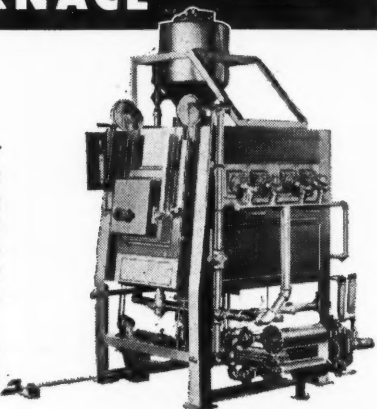
## DUAL CHARMO FURNACE

1. GENERAL HEAT TREATING
2. GAS CARBURIZING

This furnace produces its own prepared gas atmosphere for general heat treating. For gas carburizing this atmosphere is enriched and recirculated by a special mechanism. During gas carburizing treatment only a portion of the gas is passed through the recirculating system, thereby preventing the cooling of the entire gas flow. Only about 10% is removed from the muffle at any one time. Twin filter units are incorporated to avoid shut-down, for filter cleaning.

This is an ideal furnace for the plant requiring both clean hardening and gas carburizing operations.

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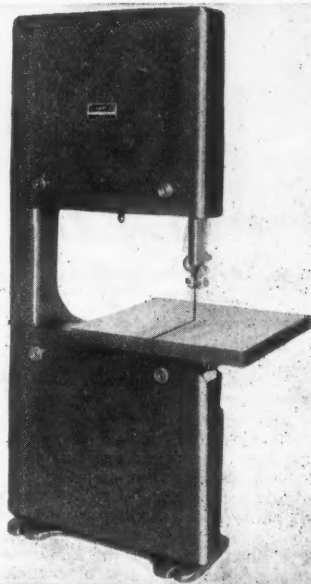
SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO

WRITE FOR  
FULL  
DETAILS

## Foster Model B-4000 Band Saw

A 14-inch band saw for metal, plastics, and wood is now being offered by the Foster Manufacturing Co., Dept. MMS, 1 Kinsey Ave., Buffalo 17, N. Y. Designated as the Model B-4000, the unit is constructed of castings which are heat treated before machining to relieve stress and distortion.

Designed for easy operation by unskilled workers, the Foster Model B-4000



Foster Model B-4000 Band Saw

Band Saw features a heavily ribbed 14 x 14-inch table surface which is ground smooth and can be tilted a full 45 degrees to the right and 15 degrees to the left. The wheels have Neoprene tires to provide for maximum oil resistance and long wear, and each wheel is dynamically balanced to assure smooth and quiet operation. All adjustments of the machine are said to be extremely simple to make.

## Teletronics Microdrill

Designated as the Microdrill, a unique precision instrument for rapidly drilling accurate small holes is announced by the Teletronics Laboratory, Westbury, N. Y.

## TAPPING TIPS

From Woody Spencer's Notebook

### Sometimes Preaching Means Too Many "Don'ts"!



Listened to a preacher the other day an' he sure was heavy on the "don'ts." Made me wonder if my "preachin'" has too many "don'ts" and not enough "dos." an' "how to's." Fer instance, keepin' a tap sharp is only half the job; keepin' it sharpened right is the rest. Here's a few "do's" fer keepin' taps sharpened right: (1) Fer best results, use a tap grindin' machine if possible. (2) If necessary to sharpen taps by hand, use the proper grain and grade wheel. (3) When sharpenin' taps on a grinder, take light cuts, otherwise the threads may be burned.



These Tapping Tips of Woody's aren't technical advice nor are they any cure-all for tapping troubles. They are just hints, ideas and short cuts some of the boys have given Woody and he's passing them on in the hope that they may serve to make some routine tapping job run a little smoother and faster, maybe save a few rejects.

When technical questions are involved, bring them to the engineers. Send complete data on the job—material, depth, diameter of hole, type of hole, lubricant, whether the hole is through or blind. Our engineers will be glad to give you definite suggestions covering your problem. No obligation, of course.

NOTE—Woody Spencer's Tapping Tips will appear here as regularly as "Woody" gets time to write them up. Look for them.



## THE RIGHT TAP AT THE RIGHT TIME

*The Wood & Spencer Company*  
Cleveland 3, Ohio

By means of a thermal motor feed and automatic electronic control circuits, the surface of the work to be drilled can be quickly and precisely located and the depth of the hole held to close tolerance.

Vertical movement of the drill is accomplished by electronically controlling the amount of electric power fed into a spring-loaded thermal unit. As the power is increased, the temperature of the unit rises and it elongates, thus allowing a powerful spring to lower the spindle. The action is said to be extremely smooth and can be precisely controlled.

The drill, it is claimed, may be quickly



Teletronics Microdrill



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*The Right File for the Right Job*  
**Three Distinct Types**  
 1. Hand Cut Files  
 2. Ground Burs  
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 Rotary Files Exclusively  
 for over 25 Years.  
 Available from your  
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 744 W. First Street  
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GIVE FINER FINISHES FASTER**



Fortman scrapers tipped with CARBOLOY Cemented Carbides stay sharp far longer than steel scrapers, permit finer finishes, and save on scraping cost per piece. Write for FREE Folder.


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and safely lowered to the work and held exactly at its surface automatically and without visual observation by simply turning a knob. Drilling the hole is then only a matter of setting the desired rate of feed and depth and operating a switch. The drill is arranged to automatically stop feeding and hold at the predetermined hole depth, and may be returned to the surface of the work by returning the switch to its original position. Lamps indicate "at surface" and "at depth" position of the drill, and an accurate dial gage measures vertical displacement.

The Teletronic Microdrill has a collet for 0.004 to 0.025-inch pivot drills for a maximum recommended electronic feed travel of 0.150 inch. A variable electric drive provides a maximum spindle speed of approximately 50,000 r.p.m.



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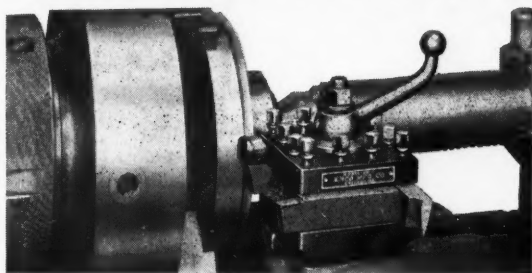


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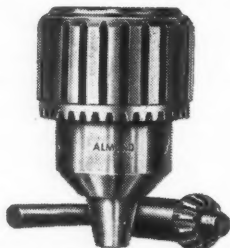
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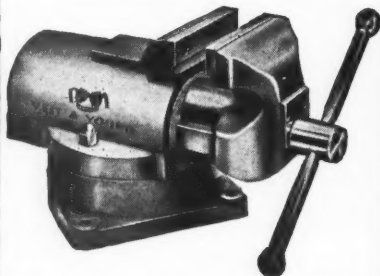


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Long guides for jaws provide strong grip. Easy swivel. Jaws: 3½", 4½", 5" open to 5", 6", 8".

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**VEIT & YOUNG**  
Established 1926  
HUNTINGDON VALLEY, PA.

## "Dustkop" Model 11B50 Dust Collector

Identified as the "Dustkop" Model 11B50, a self-contained unit type dust collector with large volume dust storage capacity for dust collecting operations where large volumes of dust, lint, chips, and so on, are involved has been brought



"Dustkop" Model 11B50 Dust Collector

out by the Agat-Detroit Co., 207 Main at Washington, Ann Arbor, Michigan.

For collecting and storing dust, the unit employs a roll-a-way bin with clamp-down cover which permits easy removal of the dust to the point of disposal. To remove the collected dust, the four latches holding the lid in position on the bin are released so as to permit the lid to move up clear of the bin where it is suspended by four springs. The connection between the unit and the lid comprises a flexible sleeve. After the contents of the bin are disposed of, the lid can be again fastened in position by



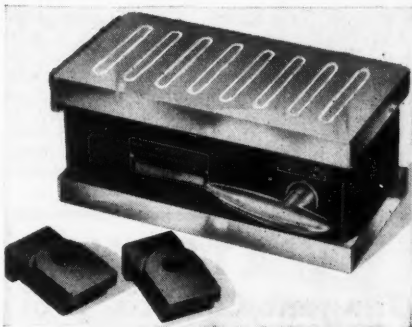
latching down the fasteners. The bin is equipped with swivel casters and handles at each end.

The actual suction capacity of the Dustkop Model 11B50 Dust Collector on a 6-inch inlet is 1,394 c.f.m. at 3.2 static suction, the suction being developed by a 1½ h.p. 3,450 r.p.m. continuous duty motor, direct driving a non-clogging paddle wheel type fan. A cyclone separator of high efficiency contained within the unit subjects the dust laden air to its first cleaning after passing through the fan. A second-stage filter of non-inflammable spun glass forms the top of the unit and provides for a second-stage cleaning of the air before it is returned to the working area. Regular shake down of the filter can be effected by means of a hand crank.

Installation of the dust collector consists simply of locating the stand in position, placing the Dustkop on the stand, and fastening the bin lid in place. The total space required for the unit is 24 x 40 inches, and the overall height of the installation is 72 inches. The bin measures 20 x 36 x 21 inches in size. The total weight of the dust collector crated for domestic shipment is approximately 400 pounds.

## Brown & Sharpe Permanent Magnet Chucks

The Brown & Sharpe Manufacturing Co., Providence 1, R. I., announces the



Brown & Sharpe No. 408 Rectangular Model Magnetic Chuck

addition of four new models to its line of permanent magnet chucks. These include a rectangular model magnetic chuck des-

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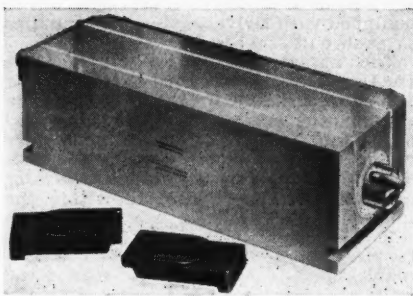
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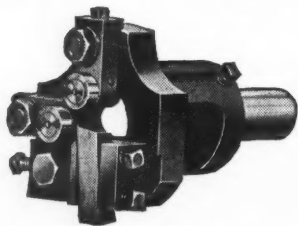
ignated as the No. 408; a rectangular models two-line magnetic chuck designated as the No. 412; a rotary model magnetic chuck identified as the No. 5R; and a rotary model magnetic chuck identified as the No. 7R.

The No. 408 chuck, with its comparatively small working surface of 4 x 8 inches, is particularly suited for use on small surface grinding machines, bench grinders, and for bench work, and is claimed to have all the advantages of other Brown & Sharpe rectangular model permanent magnet chucks, including ready portability, absence of wires and



Brown & Sharpe No. 412 Rectangular Model Two-Line Magnetic Chuck

## WATSON Tangent Cut Box Tool



A general purpose, tangent cut, roller rest box tool of wide range for turning diameters from bar stock, castings, forgings or other material. Applicable to all sorts of screw, turret and other machines, hand or automatic. It is simple to set and eliminates resetting when it is necessary to grind the bit. Write for descriptive folder giving complete information.

**The Watson Mfg. Co.**  
2222 ALBION ST. TOLEDO 6, OHIO

auxiliary generators, freedom from heat with attendant distortion in work, strong holding power, and long life. Work is held firmly when the handle of the chuck is turned to the "on" position and released by a simple 180-deg. movement of the handle to the "off" position. The magnets are said to retain their energy indefinitely.

Suited for both wet and dry grinding, the No. 408 chuck includes pole spacers that are situated close together, thus permitting the use of the chuck for holding small workpieces. The chuck is furnished with two removable stop plates, one for the back and one for the left-hand end. The plates may be adjusted vertically to suit the work. Two clamps for holding the chuck to a machine table are also furnished.

Said to have all the advantages of other Brown & Sharpe permanent magnet type chucks, the No. 412 model chuck includes two-line pole spacers and is said to be useful for grinding rows of small parts, as well as for intermediate and large size work. Work is held firmly when the control is turned to the "on" position and released when the control is

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Built sturdy and rugged for tough, heavy jobs. Adjustable to any angle. Stays locked. Accurately graduated in degrees. Jaws hardened and ground—open full size. Also use horizontally.

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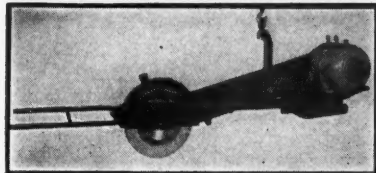


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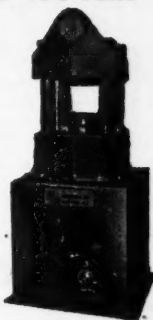
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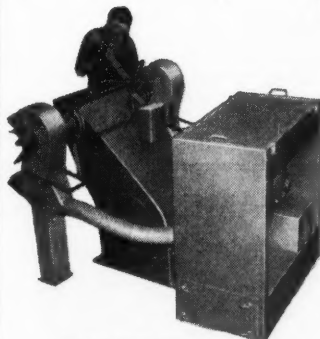
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207 Main at Washington  
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turned to the "off" position. The strength of the magnetic holding force is controlled by the amount the control is turned. The body of the chuck consists of steel and the top and bottom are ground flat and parallel.

Said to be suited for both wet and dry grinding, the No. 412 chuck is furnished with two removable stop plates, one for the back and one for the left-hand end. The plates may be adjusted vertically to suit the work. Two clamps for holding the chuck to a machine table are also furnished.

The No. 5R rotary model magnetic



Brown & Sharpe No. 5R Rotary Model Magnetic Chuck

chuck is designed to hold work from  $\frac{3}{4}$  to 5 inches in diameter for grinding on cylinder grinding machines, tool and disc grinders, as well as for use on polishing machines and small lathes. Claimed to have all the advantages of other Brown & Sharpe permanent magnetic chucks, the No. 5R includes a control ring whereby work is held firmly or released when the ring is rotated 30 deg. The control ring has eight different holes for an operating pin so that the chuck can be operated in any position in which it may stop. The strength of the holding force is controlled by the amount the control ring is turned.

Claimed to be suited for both wet and dry grinding, the No. 5R chuck includes a steel bushing in the center of the top plate for attaching a locating button for centering work. The top and bottom of the chuck are ground parallel and square



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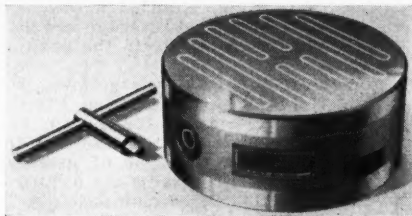
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**ONONDAGA TOOL CORPORATION**

FAYETTEVILLE  
NEW YORK



Finisher



**Brown & Sharpe No. 7R Rotary Model  
Magnetic Chuck**

with the side. The back of the chuck is recessed and has four tapped holes for attaching a No. 57RT magnetic chuck adapter which adapts the chuck for use on the spindle of a Brown & Sharpe No. 1 universal grinding machine or No. 13 universal and tool grinding machine. The chuck is furnished complete with an operating pin.

The No. 7R rotary model magnetic chuck is designed to hold work from  $1\frac{1}{8}$  to 7 inches in diameter. The work is held firmly when the detachable T-handle furnished with the chuck is turned on and released when the handle is turned off. The strength of the holding force is con-

trolled by the amount the handle is turned. The chuck has a  $\frac{1}{4}$ -inch 28 N.F. tapped hole for attaching a locating button. The back of the chuck is recessed and has four tapped holes for attaching a No. 57RA adapter which enables the chuck to be used on the spindle of a Brown & Sharpe No. 1 universal grinding machine or No. 13 universal and tool grinding machine. Magnetic chuck adapters for use on other machines can be obtained on special order.

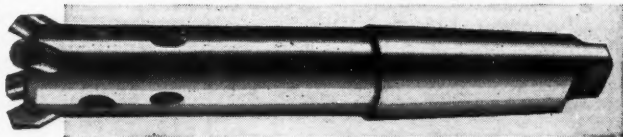
### **Landis No. 15 Chaser Grinding Fixture**

Identified as the No. 15, a chaser grinding fixture which is said to provide an extremely economical and efficient means for grinding Landis chasers is announced by the Landis Machine Co., Waynesboro, Pa. The fixture is intended for use in grinding, on the tangential chaser, the compound rake and lead angles essential to the production of accurate, well formed threads.

Supported by the base casting is a crossarm which is arranged so that the chaser platen can be adjusted vertically. This feature is said to make possible the

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Erickson adds precision methods to the manufacture of these proven, widely known production tools. The patented State 4-cutter principle permits heavier feeds at higher speeds and delivers more pieces per grind than single-point or double-cutter tools. More regrinds; less adjusting time; accurate, clean holes.



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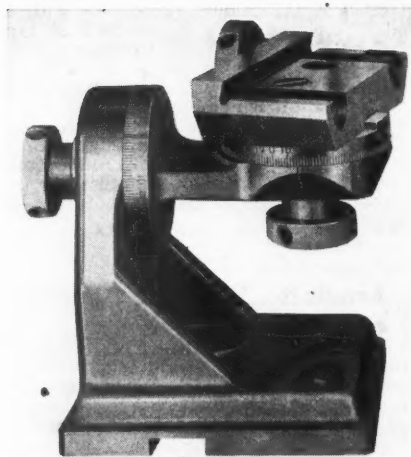
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Learn how these two companion Erickson-State tools can cut costs for you. They can be adapted to many special requirements up to 5 1/2" boring diameter. We shall be glad to design special bars.

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**ERICKSON TOOLS  
DIVISION**

2301 Hamilton Ave.  
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Landis No. 15 Chaser Grinding Fixture

grinding of any desired rake angle. The platen can be rotated throughout a 360-deg. circle horizontally, thus providing an accurate means for reproducing the

desired lead angle. Knurled knobs having pinholes for added leverage are said to hold the fixture firmly in the position in which it is set.

According to the manufacturer, the Landis No. 15 Chaser Grinding Fixture can be readily adapted for use on any grinding machine having a reversing table, regardless of the type of grinding wheel utilized. The base of the fixture is made so that it can be clamped to a T-slotted table or on a magnetic chuck. The fixture, which can be used in grinding all Landis chasers up to 1½ inches wide, measures 3¼ inches square at the base and 3½ inches in overall height.

### Elgin Model "G" Utility Hammer

A pneumatic hammer for precision work at top speed with minimum vibration, designated as the Elgin Model "G" Utility Hammer, is announced by the Borm Manufacturing Co., Elgin, Ill. Features claimed for the tool include a sturdy, compact construction of all steel and hardened where required; maximum striking power; combination locking type toolholder to eliminate danger of falling tools; and trigger air control.

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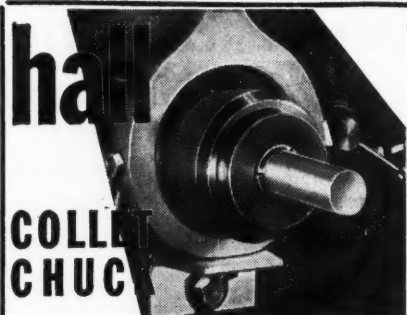


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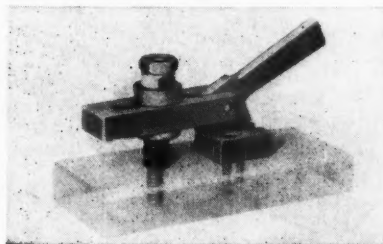
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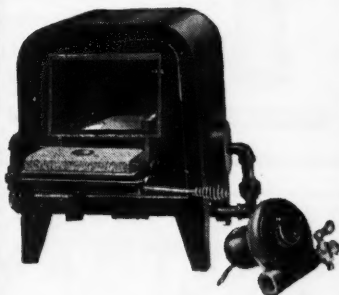
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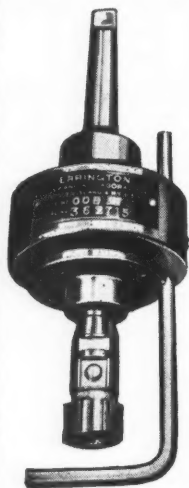
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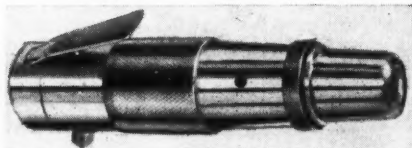
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#### Arch type Press

Pinion & Gear Cutting Machine, Thread Milling  
Machine, Cylindrical Sub-Presses, Cutter Sharpen-  
ing Machine, Small thread milling and gear cut-  
ters, Small special machinery.

The Elgin Model G Utility Hammer measures 8 inches long and has an approximate speed of 5,000 strokes per minute on 100-lb. pressure. The approximate air consumption of the tool when operated on a pressure of 100 lb. is 5 cubic feet. The hammer, which has a net



Elgin Model "G" Utility Hammer

weight of 3½ lb., can be used for scaling and cleaning welds, weld peening, die work, chipping operations, chisel work, metal cutting or ripping light gauge metal, tuck pointing, general main-tenance work, and so on.

## Sheffer "Economy" Stock Pusher

A stock pusher which can be easily ad-justed and is designed to feed to the very end of the stock is now being marketed under the trade name of "Economy" by the Sheffer Collet Co., Traverse City, Mich. The construction of the unit in-cludes a dual bearing, one portion in the



Sheffer "Economy" Stock Pusher

mid-section and one in the nose. This ar-rangement is said to provide for a maxi-mum bearing length with a correspond-ing light spring tension requirement in each bearing section to ensure positive feed.

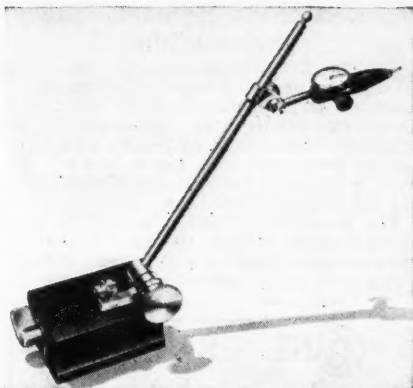
The Sheffer Economy Stock Pusher is claimed to be particularly adaptable and effective on long feedouts where feeder travel is greatly accelerated, and can be

furnished for any stock size,  $\frac{1}{4}$  inch and upward, for any machine. The unit is made of alloy steel with carefully controlled spring temper. All threads are ground from the solid after heat treatment and are said to be held to a uniform No. 3 fit.

### Brown & Sharpe No. 743 Dial Test Indicator

Featuring a fine adjustment mechanism and permanent magnet base, a dial test indicator designated as the No. 743 is announced by the Brown & Sharpe Manufacturing Co., Providence 1, R. I. The permanent magnet base measures approximately  $2\frac{1}{2}$  inches wide x  $3\frac{1}{2}$  inches long x  $1\frac{1}{8}$  inches high and is designed to hold the indicator firmly to any iron or steel surface in an upright, horizontal, or upside-down position. The post of the unit is  $9\frac{3}{8}$  inches long x  $\frac{1}{8}$  inch in diameter and the dial holding rod is  $2\frac{3}{8}$  inches long x  $\frac{3}{8}$  inch in diameter.

The range of the dial attachment is 0.030 inch by thousandths of an inch. Turning of the fine adjusting nut brings the indicator point to the exact setting



Brown & Sharpe No. 743 Dial Test Indicator

desired, thus simplifying many measurements. Its light weight is said to reduce tendency to move when the indicator is subjected to jar or vibration. A swing-o-lever permits quick release of the magnetic base from metal surfaces when desired.



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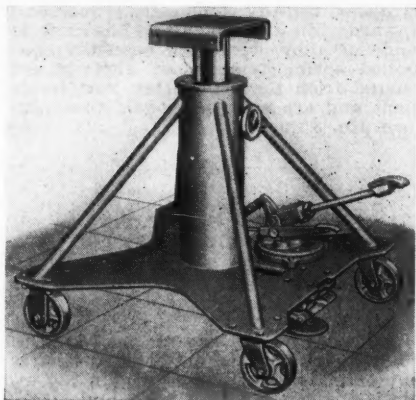


**LOVEJOY FLEXIBLE COUPLING CO., • 5007 W. Lake St., Chicago 44, Ill.**

## Lyon-Raymond Hydraulic Table Without Top

For special applications requiring an adjustable pedestal capable of handling loads up to 2,000 lb., the Lyon-Raymond Corp., 4858 Madison St., Greene, N. Y., is offering its standard hydraulic elevating table without the regular top. An 8 x 10-inch bracket is furnished for mounting special tools and fixtures.

The platform of the unit can be elevated from 28 to 44 inches by a hydraulic cylinder and single speed hydraulic foot pump with pedal release, and can be lock-



Lyon-Raymond Hydraulic Table Without Top

ed in one position or allowed to revolve freely. A 30 x 30-inch base is said to provide ample stability even for off-center loads, while two 5-inch swivel casters and two 5-inch rigid casters facilitate movement of the unit. A floor lock is provided for holding the table firmly in a particular position when required.

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**THE GRANT MFG. & MACHINE CO.**  
96 Silliman Ave. Bridgeport 5, Conn.

## B-Line Capacitor-Start Induction-Run Electric Motor

Under the trade name of B-Line, The Brown-Brockmeyer Co., Dayton 1, Ohio, is now producing a capacitor-start induction-run electric motor in  $\frac{1}{4}$  through  $1\frac{1}{2}$  h.p. 115/230 double-voltage 60-cycle single-phase 1,725 r.p.m. types having a minimum of 350 per cent starting torque. Features of the motor include a built-in fan-cooled condenser which is said to assure protection for the condenser with-

## PRODUCERS OF SCREW MACHINE PRODUCTS TO SPECIFICATIONS

We have:

ONE, FOUR and SIX spindle automatics maximum capacity  $2\frac{5}{8}$ " round. Hand Screw Machines and Universal Turret Lathes maximum capacity 3" round. Castings and Forgings machined maximum 10" diameter, 8" length, 15 pound weight. Secondary operation equipment for milling, drilling, tapping and assembling. Fabricators of aluminum, brass, steel and their alloys.

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Thompson Surface Grinding Machine, exhibited at the Chicago Machine Tool Show intended for ultra precision tool room work and lubricated with Gits Oilers.



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Patented in U.S.A. and Canada.

Bends  
standard pipe  
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in all sizes  
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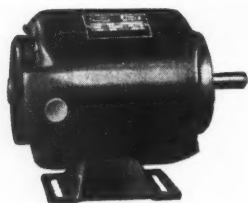
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Write for descriptive literature and prices.

**HOSSFELD MANUFACTURING CO. • WINONA, MINNESOTA**

out interfering with the air flow in fan applications. The built-in arrangement eliminates the need for mounting the condenser on top of the motor and allows for a compact design and streamline appearance.

Additional features of the motor include



**B-Line Capacitor-Start Induction-Run Electric Motor**

an entirely closed "trouble-proof" switch actuator having no tension springs or pins. All moving parts of the switch are enclosed in an easily removed precision molded ring housing. The motor, equipped with prelubricated "Life-Seal" ball bearings, is suitable for both vertical and

horizontal operation, thus eliminating the possibility of shaft end play even after prolonged use, it is claimed. All rotating parts of the motor are dynamically balanced to ensure vibration-free performance. A rugged steel housing and slotted welded steel base are said to provide rigidity for true alignment.

The B-Line Capacitor-Start Induction-Run Electric Motor is claimed to be ideal for air conditioning equipment, ventilating fans and blowers, oil burners, and similar equipment. If desired, the motor can be furnished complete with a cord, plug, and switch.

### **Pathon Double-Acting Air Cylinder**

Featuring an auto-adjusting ram seal (ram packing is automatically sealed by air pressure), together with a ram supporting bearing which enables the unit to function continuously under conditions of side thrust and off-center loading that would otherwise be detrimental, a double-acting air cylinder is now being fabricated in six standard types of mountings by the Pathon Manufacturing Co., 6801 Vine St., Cincinnati 16, Ohio.

# **PRENTISS**



**"Bull Dog" Machinists'**

# **VICES**

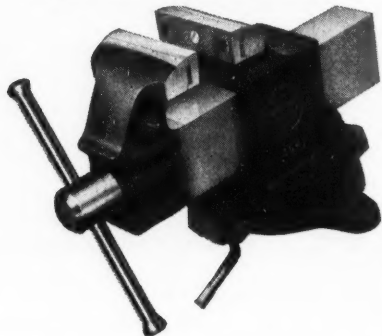
Backed by 80 years of time-proven acceptance by industry. Hundreds of plants have used them and still do. Insist on PRENTISS for that "Extra" Vise Service.

*Your Industrial Distributor  
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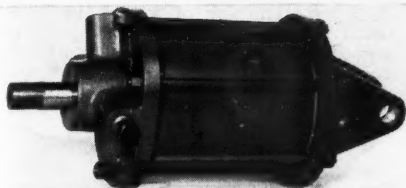
**OF THE CHARLES PARKER CO.**

**They Give  
Service That Satisfies**



**MERIDEN, CONN., U. S. A.**





**Pathon Double-Acting Air Cylinder**

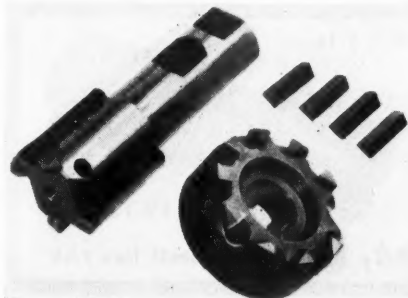
Special cylinders or mountings can be supplied if required. In addition to variations in the types of mountings, the cylinder can be built in practically any length of stroke, depending upon the requirements of the particular application. Strokes of from 1 inch to 12 feet may be obtained on all sizes up to and including 6-inch diameter and from 1 inch to 8 feet on larger sizes.

According to the manufacturer, the Pathon Double-Acting Air Cylinder is ideally suited for operations requiring reciprocating action, pushing, pulling, clamping, and the elimination of complicated mechanical linkages. The power requirements of the cylinder depend upon the application. The unit is fabricated in both cushioned and non-cushioned types and may be obtained with either a plain or threaded ram.

### Weddell $\frac{3}{8}$ -Inch Tri-Bit

Introduction of a  $\frac{3}{8}$ -inch solid carbide light duty cutter blade to its line of Tri-Bit triangular shaped cutter blades is announced by Weddell Tools, Inc., Rochester 11, N. Y. The accompanying illus-

Solid Shank End Mill and Shell Type Face Mill Equipped with Weddell  $\frac{3}{8}$ -Inch Tri-Bit



**Fast Accurate  
Measurements with  
the NEW\***

**AMIC**

**Quick  
Action  
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**for machine shop,  
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- External, internal and depth measurements all read simultaneously with a flick of the thumb on one vernier scale.
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- Painstakingly machined, American made.

Catalog Number	Size	Scale Graduations	Vernier Reading
21	6"	1/40"	.001
22	6"	1/40" & full mm.	.001 & 1/10 mm.

**Also AMIC Precision Vernier Calipers, Height Gages, Depth Gages, Pocket Calipers, Precision Graduated Metal Scales.**

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**AMERICAN MEASURING  
INSTRUMENTS CORP.  
240 WEST 40th STREET  
NEW YORK 18, N. Y.**

tration shows  $\frac{3}{8}$ -inch Tri-Bits applied to a small shell type face mill and solid shank end mill. The triangular tool bits are quickly and positively locked into vees in the triangular shaped holes in the cutters by simple lock screws. No wedges are required. The Tri-Bits are adjustable by individual adjusting screws.

According to the manufacturer, the triangular cutter blades permit close blade spacing with maximum chip clearance. The minimum size shell type face mill which can be furnished with  $\frac{3}{8}$ -inch Tri-Bits is 2-inch diameter x  $\frac{3}{4}$ -inch bore and includes ten adjustable carbide

blades. Solid shank end mills can be furnished in diameters of 1 inch up. The  $\frac{3}{8}$ -inch Tri-Bits can also be applied to many other types of cutters, such as boring, facing and chamfering heads and hollow mills.

### Falcon T. I. Drive

Production of a T.I. (taper interchangeable) drive, an outstanding feature of which is the speed with which it can be



Falcon T.I. Drive

assembled and disassembled, is announced by the Falcon Tool Co., Dept. MMS, 12502 Greiner, Detroit 5, Mich. A slight twist of the wrist provides for locking of the cutting tool firmly in place and a slight turn of the drive in the reverse direction releases the tool.

According to the manufacturer, the unusual rigidity of the Falcon T. I. Drive makes it ideal for interchangeable carbide-tipped counterbores and step cutters.

### Ideal "Universal" Model Electric Etcher

Products made of steel, iron, or their alloys can be quickly and easily marked, it is claimed, by means of the Ideal "Universal" Electric Etcher now being manufactured by Ideal Industries, Inc., 1031 Park Ave., Sycamore, Ill. Regardless of the hardness of the metal, the

## Why THOR STAMPS Last Longer



... because they're made of a special, correctly - heated alloy steel. Central striking point assures uniform marking. Thumb side marking assures easy use.

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## AIRLOX

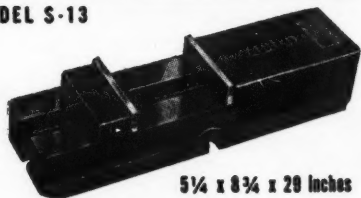
PNEUMATIC and Hydraulic Vises

Jaw force: 90 times air-line pressure

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**production devices, inc.** Whitehall, New York

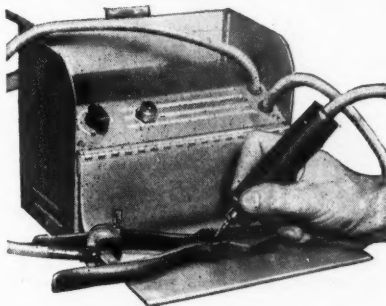
MODEL S-13



$5\frac{1}{4}$  x  $8\frac{3}{4}$  x 20 inches

etcher is said to burn into the surface, producing a smooth and permanent mark.

The Ideal Universal Model Electric



Ideal "Universal" Model Electric Etcher

Etcher is enclosed in a streamlined metal case for ready portability from one job to another. When open, the cover forms a work plate on which to place small tools and parts for etching. A "C" ground clamp is furnished for use when

etching parts that are too large for the work plate.

The point of the tool is so mounted in the handle that cooling air can circulate around it, thus providing for comfortable handling of the etcher. Four etching heats of 120, 240, 420, and 700 watts are available for producing permanent identification markings on hard-to-get-at tools and instruments, etching names on products, marking stock, and so on.

### Maxwell Automatic Recessing Toolholder

The Maxwell Co., 325 Broadway, Bedford, Ohio, announces the extension of its standard line of Max-WELL-Made recessing tools to include a recessing toolholder designed especially for use with machines having automatic feeds. The toolholder is operated by a drawbar having a telescopic adjustment for tool location, and can be used with circular form cutters, either high speed steel or carbide tipped. Adjustment for depth of recess can be made readily by a collar on the toolholder body.

The Maxwell Automatic Recessing Toolholder is available in a range of sizes to

**WHITNEY-JENSEN PRODUCTS**  
38 YEARS EXPERIENCE

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**Showing numerous time and  
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**WHITNEY METAL TOOL COMPANY**  
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*McKiernan-Terry*  
**BLACKER HAMMER**



POWER HAMMER  
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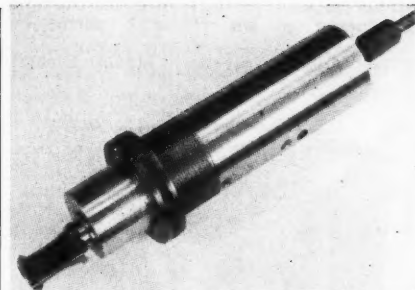
Install this powerful, sensitive, electric-motor-driven sledge hammer and you'll increase anvil capacity, get greater shop output. It delivers sledge-hammer blows *exactly* the way the smith wants them—light, heavy, fast, slow—on any part of the anvil. He regulates speed, force and position by foot pedal control, leaving both hands free to manipulate work. Alone, without helpers, he gets jobs done quicker, with more precision, with fewer heats per job.

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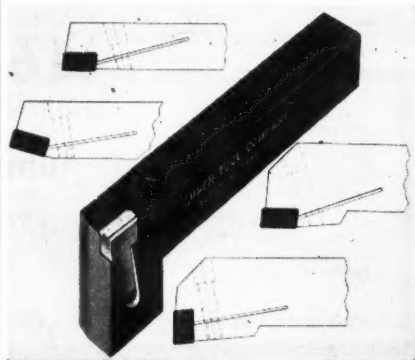
Maxwell Automatic Recessing Toolholder

accommodate all standard types of slide toolholders. Features, in addition to those facilitating rapid setup, include (1) unusual capacity, (2) sturdy support for form cutter over the entire range of tool capacity, (3) positionable cutting tool block which makes it possible to design form cutters having minimum overhang, (4) provision for introducing lubricant or coolant through tool to cutting edge, (5) accurate and close adjustment convenient for operator, and (6) set of variable length drawbar components for operator's selection in using the toolholder through a wide range of operations.

**Super Rectangular Ejektor Tool**

Introduction of a vertical type ejektor tool with rectangular carbide insert is announced by the Super Tool Co., Dept. MMS, 21650 Hoover Rd., Detroit 13,

Super Rectangular Ejektor Tool



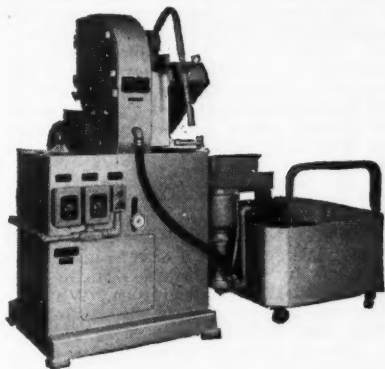
Mich. The tool is offered in two styles. One style, a straight holder for shoulder cuts; presents the carbide insert with a 15-deg. lead angle, or at right angle, to the work. The other style is an offset holder for heavy roughing cuts. This style holder is also available in a 15-deg. lead angle or right-angle model. Both style holders are offered in models for holding the rectangular inserts lengthwise or crosswise to the holders.

According to the manufacturer, an outstanding advantage of the Super Rectangular Ejector Tool is the fact that the tool utilizes inserts which are standard with all manufacturers of carbides, thus allowing the user a wide choice of carbide grades and manufacture at maximum economy.

### Campbell Model 223 Bar Cutter

Known as the Campbell Model 223 Bar Cutter, a hand operated wet abrasive cutting machine designed for fast, high quality cuts on practically all types of materials up to 2-inch diameter solid stock and 3½-inch diameter tubing is announced by the Andrew C. Campbell Division, American Chain & Cable Co., Inc., Bridgeport, Conn. The machine fea-

tures a 5-inch wheel flange, wheel guides, automatic work stop, automatic coolant pump operation, and automatic hydraulic



Campbell Model 223 Bar Cutter

work clamp, and is painted No. 7 machine tool gray. All interior parts, such as the work holder, work clamp, and so on, are cadmium plated.

Acme Offers Complete Facilities for All Types of

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FAST SERVICE... EXPERT WORKMANSHIP... LOW COST

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Acme is equipped to handle all types of precision grinding. Expert craftsmen, using newest methods and modern equipment, will do the job for you faster, better, more economically. Acme also offers a flat lapping service that can finish surfaces to within millionths. Write for details.

## Acme Industrial Company

Makers of Standardized Jig & Fixture Bushings

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THE SERVICE SHOP TO INDUSTRY FOR MORE THAN 25 YEARS

A completely separate wheel mounted coolant tank is an additional feature of the Campbell Model 223 Bar Cutter. The design of the tank permits easy removal for chip cleaning and provides separate compartments to settle out sludge and keep coolant cool. The coolant pump is completely automatic in operation. A distributor unit provided is so constructed that coolant is distributed over the abrasive wheel, thus resulting in straight cuts, cool cutting, and long wheel life, it is claimed.

### Swich-O-Matic Reversing Control

A mechanical control device now being produced by the Swich-O-Matic Co., Dept. MMS, 124 W. Hadley St., Whittier, Calif., can be used on drill presses, engine lathes, and turret lathes with 220, 440, and 550-volt motors where accurate automatic spindle reversing operations are to be performed. The unit is designed to provide for high machine production by permitting the threading of non-ferrous materials at unusually high speeds. The size of tap used is said to be limited only to the chucking capacity of the machine.

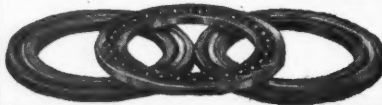
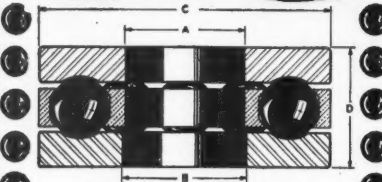
If desired, the Swich-O-Matic Reversing Control can be used in conjunction



Swich-O-Matic Reversing Control Installed on a Lathe

with a multiple drill head, thus converting a drill press into a semi-automatic multiple tapping machine. The control can be operated either automatically or manually on intermittent operations without changing the machine setup.

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BALL THRUST BEARINGS**

STANDARD SIZES OR SPECIAL DESIGN to your specifications; send sketch or worn sample, regardless of condition, for quotation, without obligation. • Our complete catalog will help you in making selection of bearings—shall we send it? Also ask for illustrated literature on Gwilliam ball thrust and roller thrust bearings.

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*Write Today.*

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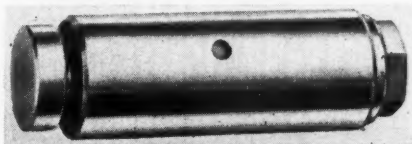
Chicago 18, Ill.



## B & S Revolving Stock Stop

A revolving stock stop for turrets Nos. 00 Short, 00A Long, 20 Short, 20A Long, 22 Short, and 22A Long is announced by the Brown & Sharpe Manufacturing Co., Providence 1, Rhode Island.

Designed to position the end of stock



B & S Revolving Stock Stop

at a specified distance from the nose of the collet, the stop includes a hardened and ground head. The thrust on the head is taken by a ball which allows the head to rotate freely and is said to prevent marring of the outer end of the work-piece.

## "2-in-1" Econotool

Featuring a flexible spring steel clamp arrangement which is said to allow "stalling" in cut with feed engaged without shattering the tip, the "2-in-1"

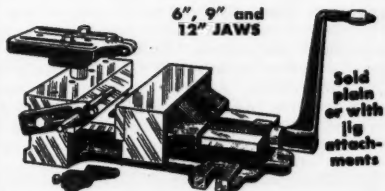


"2-in-1" Econotool

Econotool shown herewith is now being marketed by the Econotool Co., Box 262, Jenkintown, Pa. The "2-in-1" hardened alloy steel holder has two clamping positions, thus allowing easy reconditioning. The positive adjustment feature of the tool is claimed to make it especially adaptable for semi-automatic, and so on.

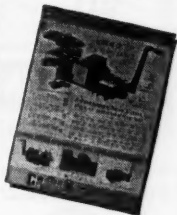
The 2-in-1 Econotool is 1 inch square and is available in standard grades of carbide and cast alloy.

## A good vise --- and a lot more!



## GRAHAM MULTI-PURPOSE VISE

A beautifully made plain vise, constructed with surfaces flush, parallel and square—that's only the beginning. In addition, this vise becomes a many-purpose jig or fixture for positioning all sorts of plain, round and irregular shapes on drill press, radial, miller, shaper, planer, grinder for repeat-operation work. An accurate tool—a great time-saver!



## "Adjust-angle" KNURL HOLDER

Many patterns  
using only  
straight  
knurls.



On work up to 2 1/4" dia., this Knurl Tool produces a variety of straight, spiral and diamond patterns, using only straight knurls. Shank made to fit your turret (or lathe tailstock). Equipped with passing-over-stock feature if desired. Graduated adjustment of knurl angle.

For prices and details request  
Bulletin 41

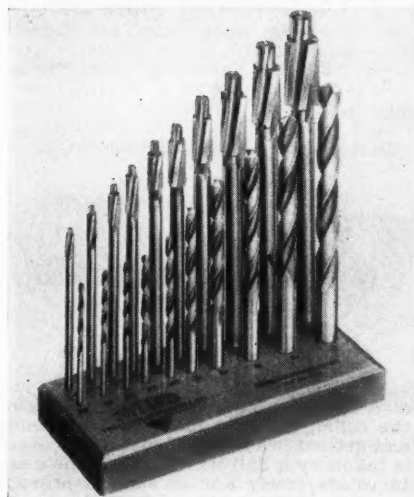
**Graham Mfg. Co.**

34 Bridge St.

East Greenwich, R. I.

## "Superbore" Drill and Counterbore Sets

The Twentieth Century Manufacturing Co., 3724 Montrose Ave., Chicago 18, Ill., announces that "Superbore" Drills and Counterbores, made in decimal sizes from super-tough fine-grade high speed steel, are now available in sets consisting of standard sizes or oversizes above the standard dimensions. Each set is individually serial numbered for identification by the owner where there are several sets in one plant or shop, and also for inventory control. Size markings are lo-



"Superbore". Drill and Counterbore Set



### Carbide Tipped Centers

Essential for metal working lathes where high speeds or extreme cutting pressures are encountered. Tungsten carbide tip will withstand more wear than any other metal. Entire center precision ground.

No. 2 Morse Taper . . . . . postpaid \$4.50

No. 3 Morse Taper . . . . . postpaid \$8.00

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427A E. Madison St.  
South Bend 22, Ind.

### POROUS BRONZE BEARING

#### PILLOW BLOCKS



**No Oil Drip Here!**  
Cast iron housing with trouble-free oil-impregnated porous bronze bushing.

Shaft dia.:  $\frac{1}{2}$ "  $\frac{3}{8}$ "  $\frac{3}{4}$ "  $\frac{7}{8}$ "  $1\frac{1}{8}$ "  $1\frac{1}{4}$ "  
Write for Catalog Sheet and Price List.

**'Precision'**

**PRODUCTS CO.**  
815 Pryor St., S.W.,  
Atlanta, Ga.

### Rev-Tuner

Designated as the Rev-Tuner, a pocket-size precision instrument for quickly and accurately measuring the speed of any engine or motor is now being marketed by the Rev Products Co., 406 Market St., Elmira, New York.

The instrument can be simply held to any engine or motor mount where the thin spring steel "reed" can be adjusted by a free moving thumb wheel or "tuned" until the reed begins to vibrate vigor-

## TOOLRAK Saves TIME AND TOOLS

Your workers always have the right tools at their fingertips when you equip your shop with Toolrak. Because the selected hardwood blocks are interchangeable in the extruded aluminum backstrips, you arrange them any way you want, rearrange as often as you wish. Get Toolrak in factory-assembled sets or buy individual blocks and strips to fit your special needs. Send for free folder.

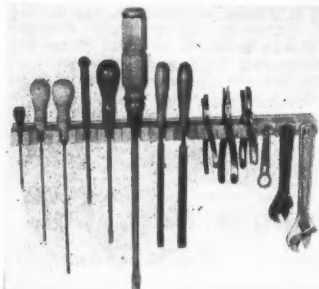
Set No. 8-7, 8" long, holds 7 tools, \$1.25

Set No. 12-10, 12" long, holds 10 tools, \$1.90

Set No. 18-14, 18" long, holds 14 tools, \$2.55

If your dealer or mill supply house can't supply you, order direct. Mail orders add 10¢ per set to cover packing and mailing.

**DAVIS DEVELOPMENT CO.** • 348-5 1st Nat'l Bk. Bldg.  
Colorado Springs, Colo.





Rev-Tuner

ously at an amplitude many times that of the vibrating body. When tuned for maximum response, the frequency (or

speed) is quickly and accurately indicated on a graduated scale, no figuring or mathematics being required.

### South Bend De Luxe Work Supports

To provide for unusually quick and efficient operation on certain classes of lathe work, the South Bend Lathe Works, 386 E. Madison St., South Bend 22, Ind., has developed the De Luxe Follower Rest and Center Rest shown herewith. Principal advantages of both the follower rest and center rest are the wrenchless adjustment and locking of the jaws. Each jaw has a large knurled knob for adjusting the jaw position and a thumbscrew for locking. A uniquely designed double-acting compound screw thread provides a jaw movement of approximately  $\frac{1}{8}$  inch for each revolution of the adjusting knob. Smooth action, with just enough resistance to hold the jaw firmly in position until it is locked with the thumbscrew, is said to permit quick adjustment with extreme precision.

The jaws are made of brass and slide through precision steel sleeves which are pressed into the supporting frame. Manu-

## MICO

### 2 and 3-Dimensional ENGRAVER

- NOW you can do three-dimensional milling by tracing shape of enlarged master with stylus. The 252 Engraver fills the need for a portable, inexpensive, dependable and accurate machine to make small dies and molds for plastics, rubber, glass, or die castings, and other forming operations. Master can be reproduced in any of four reduction ratios.

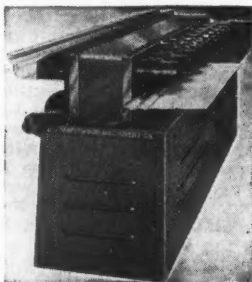


Improved pantograph design simplifies conventional engraving of templates, nameplates, panels, trademarks and machined parts.

Write for 8-page illustrated folder which gives complete details.

**MICO INSTRUMENT CO.** 76 TROWBRIDGE ST.  
CAMBRIDGE, MASS.

## Roll Forming Machines and Roller Dies

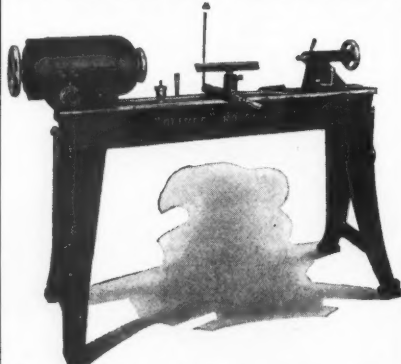


Also Pittsburgh Lock Machines, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery—

*Your inquiries invited.*

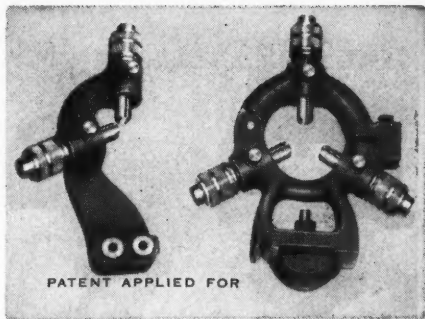
**Maplewood Machinery Co.**  
2636 Fullerton Ave., Chicago, Illinois

## "OLIVER" METAL SPINNING LATHES



Has rigid, heavy bed for accurate work. Heavy duty ball bearing headstock is adjustable for speeds from 800 to 2750 RPM. Live tail center. Also for turning wood and light cuts of metal. Four sizes. Ask for Bulletin.

**OLIVER MACHINERY COMPANY**  
Grand Rapids 2, Mich.



South Bend De Luxe Work Supports

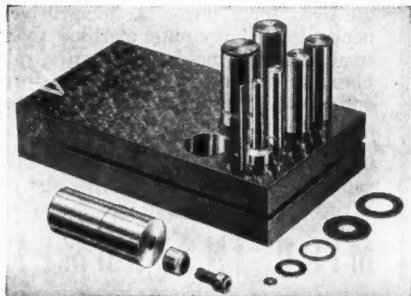
factured to close tolerances throughout, the jaws and other parts are easily replaceable. Both the follower rest and center rest are available for current models of South Bend lathes.

## Davis-Larrick Shim and Washer Die Set

A handy shim and washer die set which is designed to pierce holes and produce washers, gaskets, shims, and so on. for electricians, plumbers, millwrights, sheet metal workers, experimental laboratories, and other jobs is now being marketed by the Davis-Larrick Manufacturing Co., Box 191, Route No. 2, Dayton 10, Ohio. The set is also claimed to provide tool and diemakers with an efficient means for piercing the thinnest shim stock or up to  $\frac{1}{16}$  inch through mild steel without burring.

Designed to pierce steel, plastic, mica,

Davis-Larrick Shim and Washer Die Set



rubber, and other materials, the Davis-Larrick Shim and Washer Die Set is made of high grade tool steel, hardened and drawn to withstand shock without breakage. The set is available in two models. Set No. 1 has the following specifications: die dimensions, 7 inches long x 4 inches wide x  $1\frac{1}{8}$  inches thick; throat,  $\frac{1}{8}$ -inch spread x  $5\frac{1}{2}$ -inch depth; punch size,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ ,  $\frac{7}{8}$ , and 1 inch; pilot sets,  $\frac{3}{8}$ ,  $\frac{1}{2}$ , and  $\frac{3}{4}$  inch; punches adept to pilots,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and 1 inch. Specifications of Set No. 2 are as follow: die dimensions, 7 inches long x 4 inches wide x  $1\frac{1}{8}$  inches thick; throat,  $\frac{1}{8}$ -inch spread x  $5\frac{1}{2}$ -inch depth; punch size,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ ,  $\frac{7}{8}$ , and 1 inch; pilot sets,  $\frac{3}{8}$ ,  $\frac{1}{2}$ , and  $\frac{3}{4}$  inch; punches adept to pilots,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ , and 1 inch.

### Power-Grip Hand Separator

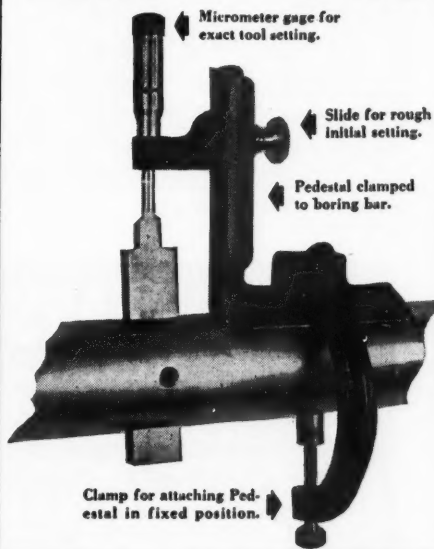
For separating steel pieces from non-magnets materials such as stone, brass, aluminum, and so on, the Rockford Magnetic Products Co., Inc., 1300 18th Ave., Rockford, Ill., is offering the Power-Grip Hand Separator shown in the accompanying illustration. The unit can be furnished with a rectifier for changing 110 volts, a. c. to 6 volts d. c., or can be operated with



Power-Grip Hand Separator

a portable 6-volt dry cell battery. The low voltage is said to eliminate the possibility of shock.

## HERE IS A REAL TIME-SAVER!



... AND WORK-SAVER, TOO!

### The Bartelt Pedestal Micrometer

Enables you to set boring tools *accurately* from the bar diameter—eliminates common cut-and-try methods. Permits quick micrometer height measurements from flat or round surfaces. Can be used as a production-inspection tool with a wide range of settings. Ideal for jobbing shop and toolroom mechanics. Quality construction, moderately priced—sold direct-to-you by the manufacturer. All components precision machined of high grade materials and carefully assembled. Packed in carrying case with necessary accessories. Made in eight models for various applications. Write today for literature and direct-to-you prices.

**BARTELT ENGINEERING CO.**

1216 Partridge Ave.

BELOIT • WISCONSIN

The Power-Grip Hand Separator measures 2 x 6 x 6 $\frac{1}{4}$  inches in size and weighs 8 pounds.

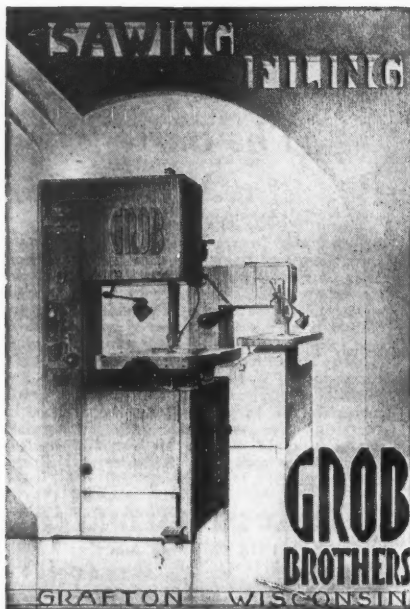
### Horton Kee-Way Broach

Of particular use to jobbing machine shops, builders of special machinery, and repair and maintenance departments is a simple sturdy push broach designated as the Horton Kee-Way Broach which is now being produced by The Sloan Machine Co., 18725 St. Clair Ave., Cleveland



PRESSES  
FEEDS  
AUTOMATIC  
EQUIPMENT

The V & O Press Company, Incorporated  
HUDSON, NEW YORK



10, Ohio. The broach consists of a hardened and ground body slotted for a high speed steel blade which is held firmly in place by a heavy locking nut.

According to the manufacturer, the Horton Kee-Way Broach can be used on any arbor press, every keyway produced with the tool being absolutely central with the hole, square, and the exact width and depth. The number of passes that must be made in order to complete the keyway varies from 2 to 5, depending upon the size of the bore. The broach is available in body diameters of from  $\frac{3}{8}$  to  $2\frac{1}{2}$  by  $\frac{1}{8}$ -inch increments for broaching standard keyways in holes ranging in length from  $1\frac{1}{2}$  inches to 5 inches.



Horton Kee-Way  
Broach

### "Ray-Man" V-Belt

The addition of a V-belt designated as the "Ray-Man" to its line of industrial rubber products has been announced by the Manhattan Rubber Division, Raybestos-Manhattan, Inc., Passaic, N. J. Especially designed for applications requiring a durable rugged drive, the V-belt is claimed to feature resistance to oil, heat, and static.

## BEVEL GEARS

PROMPT DELIVERY

UP TO 12" DIAM. - 3 D. P.  
CUTTING ONLY or COMPLETE GEARS

LATEST GLEASON EQUIPMENT



*Greaves*

MACHINE TOOL CO.

BG-2015 Eastern Ave.  
Cincinnati, Ohio



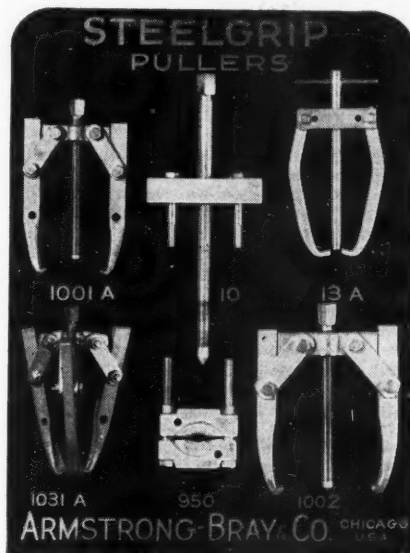


## Threadwell Fixed Gages

A line of standard, conventional type fixed gages is announced by the Threadwell Tap & Die Co., Dept. MMS, Greenfield, Mass. The line includes plain plug and ring gages, thread gages, snap gages, dial indicator snap gages, and special fixed size gages.

## Armstrong-Bray Display Board and Tool Rack

Armstrong-Bray & Co., Dept. MMS, 5364 Northwest Highway, Chicago, Ill.,



Armstrong-Bray Display Board and Tool Rack

announces a combination display board and tool rack for six of the most popular "Steelgrip" pullers used for the removal of gears, wheels, and bearings. The board can be used either as a counter or wall display or for a shop tool rack.

## Model 500 Recording Gage

Designated as the Model 500, an automatic dimensional recording gage announced by the Federal Products Corp., 1144 Eddy St., Providence 1, R. I. is designed to measure a workpiece and re-



## TOUGH FLOOR RESURFACER

**Makes Solid Patches  
or Complete Overlay**

Use tough RUGGEDWEAR resurfacer over wood or concrete floors. Here is a material which will stand up under the most punishing traffic conditions. Simple to install—there is no chopping or chipping required. You merely sweep out the spot to be repaired—mix the material—then trowel it on. Holds solid and tight right up to irregular edge of old concrete. RUGGEDWEAR provides a firmer, tougher, smoother, and more rugged wearing surface. Used indoors or out. Dries fast.



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for

**FREE  
TRIAL  
OFFER**



### FLEXROCK Co.,

3615 Filbert St., Philadelphia 4, Pa.

Canadian Office: 21 King St., E., Toronto, Ont.

Please send me complete RUGGEDWEAR information . . . details of TRIAL ORDER PLAN—no obligation.

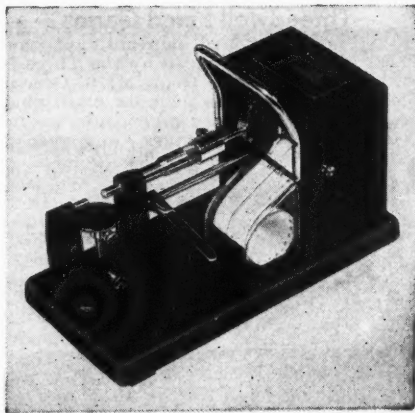
Name .....

Company .....

Address .....

cord the resulting dimension on a continuous tape which is ruled off in increments of thousandths and half thousandths of an inch, thus making it possible to obtain not only a rapid accurate record of the dimensions of production parts but to obtain a permanent record automatically.

Easily used by unskilled operators, the gage is compact, portable, and entirely self-contained and can be readily modified so as to handle workpieces of various shapes and sizes. It normally has a range of 0 to 1 inch and will check within limits of minus 0.003 inch to plus 0.003



Model 500 Recording Gage



### WADE ENVELOPES

protect  
**Shop Orders, Drawings,  
Blueprints, Etc.**

Made in three styles, transparent, fibre, and metal backs. Non-inflammable acetate windows. Special style or size to order. Write for details.

**WADE INSTRUMENT COMPANY**

Phone: CEDAR 4728

1422 E. 109th St., Dept. M., Cleveland, Ohio



QUICK DELIVERY

Write for Specification  
Sheets and Prices. . . .

COLONIAL BUSHINGS, Inc.

P.O. Box 37, Harper Station, Detroit 13

COLONIAL

DRILL JIG BUSHINGS

inch. The chart is capable of recording 35,000 measurements without change; 450 measurements can be recorded on one foot of tape. Measurements are recorded by an ink dot.

The Model 500 Recording Gage is also provided with a clamp for fastening to a machine tool and with a foot pedal for foot operation so as to leave both hands free for handling workpieces. Although the instrument is said to be unusually well suited to modern statistical quality control applications, it is applicable to practically any dimensional inspection work since it is designed to provide a continuous visual picture of the dimensional quality of the user's production.

### Sturdimatic Special Live Center

A special live center adapted to tube turning is announced by the Sturdimatic Tool Co., 5222 Third Ave., Detroit 2, Mich.



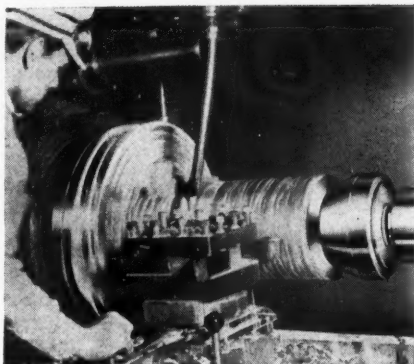
DRILL THESE HOLES

BY A QUICK, EASY, INEXPENSIVE METHOD

Your business letterhead will bring literature.

**WATTS BROS. TOOL WORKS**

Wilmerding, Pa.



**Sturdimatic Special Live Center**

The center is available in diameters of 1%, 2%, 2½, and 3¼ inches with standard shanks having Morse tapers. Other sizes in taper and blunt nose types can be produced to specifications.

Features of the Sturdimatic Special Live Center include a low overhang design and a slight cushioning action that is said to compensate for expansion due

to heat, shock, and excessive thrust loads, thus reducing wear to a minimum. A large thrust bearing is said to take all thrust load, while a large radial bearing accommodates radial load only.

### **Brown & Sharpe Center and Small Hole Attachment Set No. 573**

For use with its 61 inch and 150 mm. vernier calipers Nos. 570, 571, and 572, the Brown & Sharpe Manufacturing Co., Providence 1, R. I., has placed on the market a center and small hole attachment set designated as the No. 573. The center points of the set are said to quickly convert a 6-inch or 150 mm. vernier caliper into a direct reading divider that establishes center distances with precision. With the points, a vernier caliper may be used in locating holes to be drilled and in establishing locating points in layout jobs. A vernier caliper so equipped can also be used in accurately measuring the distance between two points or the distance between a point and some locating part.

The small hole points of Set No. 573 used with a 6-inch or 150 mm. vernier caliper make possible measurements be-

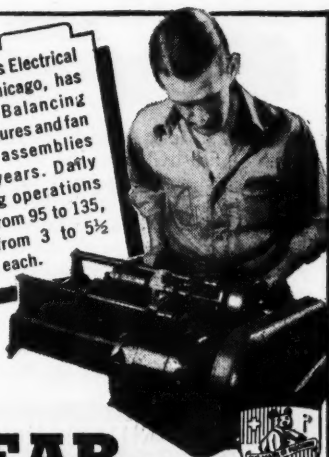
**CASE REPORT No. 48** from a series of actual cases recording the successful application of BEAR DY-NAMIC BALANCING to industry.

### **Electric Tool Manufacturer Adds Years To Life Of His Products Through Dy-Namic Balancing**

Because Bear Dy-Namic Balancing makes for a smooth and more quietly-operating rotating assembly, free from friction and vibration, it adds years to the life of the finished product. This has been proven again and again by U. S. Electrical Tool Co. and hundreds of other manufacturers who have Bear-Balanced rotating parts weighing from 4 oz. to 8 tons. An operation similar to yours is most likely represented in our Case Report file. Write for particulars, as well as a copy of the latest Bear Industrial Balancing Catalog. Bear Mfg. Co., Dept. M-25, Rock Island, Ill.

2655 MT

United States Electrical Tool Co., Chicago, has been Bear-Balancing fans, armatures and fan armature assemblies for five years. Daily balancing operations number from 95 to 135, require from 3 to 5½ minutes each.



**BEAR** STATIC AND  
DY-NAMIC BALANCING MACHINES

**AUTOM**



## CONTINUOUS HINGES

Manufactured by  
**AUTO MOULDING  
& MFG. CO.**

WRITE FOR STOCK LIST  
1114 E. 87TH ST. CHICAGO 19

## FINISHED

### MACHINE KEYS



We are able to furnish the following types of finished machine keys of any size and taper: Gib head taper keys, Plain taper keys, Straight keys, Round end feather keys and Tit keys. We can supply you quickly with the quantities you need at the specifications you require.

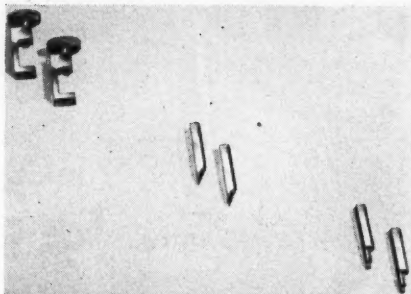
Send for new catalog giving complete information on Woodruff keys, taper pins, machine keys and machine racks.

**STANDARD STEEL SPECIALTY  
COMPANY**

BEAVER FALLS

PENNSYLVANIA

PLANTS: BEAVER FALLS, PA. • HAMMOND, IND.



Brown & Sharpe Center and Small Hole Attachment Set No. 573

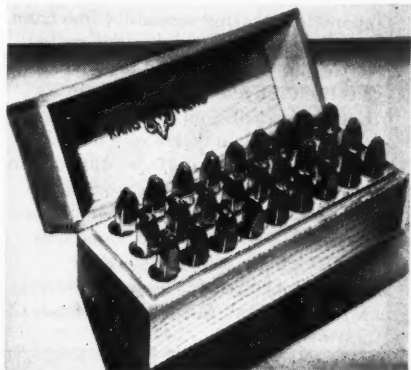
tween holes and recesses too small to accommodate the jaws of the vernier caliper. These points have two sizes of measuring surfaces with semi-circular cross sections. The smaller size has a 0.025-inch (0.64 mm.) radius and the larger, a 0.050-inch (1.27 mm.) radius.

With the small hole points mounted on a vernier caliper, precision measurements may be quickly and accurately made between holes or recesses or between a hole and some other locating part. The complete Set No. 573 includes two clamps, two center points, two small hole points, and a case.

### Acme "Rams Head" Metal Marking Stamp

A metal marking stamp with striking head which is tempered by a special pro-

Acme "Rams Head" Metal Marking Stamp



cess that is said to prevent chipping or mushrooming of the head, thus assuring long useful life, is now being marketed under the trade name of "Rams Head" by the Acme Marking Equipment Co., 8030 Lyndon, Detroit 21, Mich. Made of a high grade tool steel which is blued for rust prevention, the stamp is available in convenient box sets that include a complete series of letters (A through Z, plus &) and figures 0 through 8 (6 is inverted for 9). The container in which the stamps are furnished consists of a sturdy dust-proof wooden case which is partitioned for convenience in using and storing.

The Acme Rams Head Metal Marking Stamp is available in standard styles for marking parts, tools, name plates, and machinery, and in reverse styles for marking molds, forming dies, die casting dies, and drop forging dies. Each stamp is clearly marked on the front with the character designation and size, thus indicating the correct position for stamping.

### "Norflex" Cut-Off Wheel

The development of a reinforced type resinoid-bonded cut-off wheel which is said to combine unusual strength and

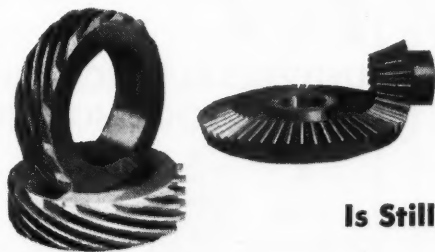
flexibility to provide a high margin of safety is now being marketed under the trade name of "Norflex" by the Norton Co., Worcester 6, Mass. The sides of the wheel present a unique file-like surface which is claimed to greatly enhance the cutting action of the wheel. According to the manufacturer, at cutting speeds reaching a maximum of 16,000 feet per minute at the periphery of the wheel, the concentric rows of molded "teeth"

themselves impart a highly effective cutting action, supplementing the normal cutting action of the multitude of sharp cutting points and edges presented by the Alundum abrasive cutting grains in the periphery of the wheel.

The Norflex Cut-Off Wheel is available



"Norflex" Cut-Off Wheel



## Consider These Factors

While Your Product Is Still On the Drawing Board

Custom-made gears especially designed to fit your product will give you simpler, more efficient operation than is generally possible otherwise. Adams gears are produced on the finest, newest gear cutting machinery, by master craftsmen with long experience, to give you gears which conform precisely to your specifications. Moreover . . . smoother operation, greater accuracy, and longer life are insured through Adams quality control which includes rigid inspection at all stages of manufacture. Write for details:

### THE ADAMS COMPANY

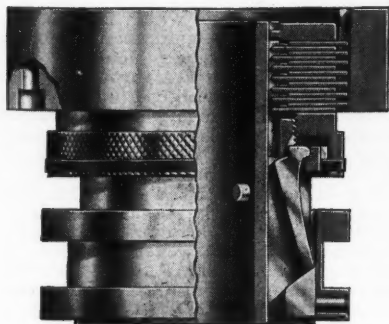
1942 Cypress Street, Dubuque, Iowa

in three standard diameters of 14, 16, and 20 inches and in two thicknesses of  $\frac{1}{2}$  and  $\frac{3}{4}$  inch. For cutting off gates and risers on non-ferrous castings of such a size or composition as to tend to cause wheel breakage, the Norflex wheels in the softer of the three available grades (namely, O or R) are recommended. The complete markings of these wheels are A241-O14BN and A241-R14BN. The  $\frac{3}{4}$ -inch thick wheels are recommended for unusually severe jobs requiring maximum wheel strength. For jobs relatively free from danger of wheel breakage but where fast cutting and unusually long wheel life as essential, a harder wheel, designated as the A241-V10BN, is available.

### "Maxitorq" Floating Disc Clutch with Non-Locking Lever

The Carlyle Johnson Machine Co., Manchester, Conn., announces that its "Maxitorq" Floating Disc Clutch is now available with a lever which is so designed that the clutch cannot be locked into engagement. According to the manufacturer, the clutch with non-locking type

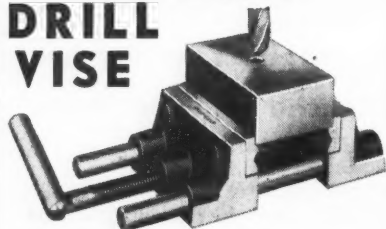
lever may be used on machinery designed for foot pedal operation or where engagement of the clutch is rapid and frequent, for rapid traverse mechanisms, or for



"Maxitorq" Floating Disc Clutch with Non-Locking Lever

any operations where it is preferred not to lock the clutch into engagement. The non-locking lever is included as standard equipment of the clutch.

## COOK'S 3-Way SHUR-GRIP DRILL VISE



Holds square, rectangular or round parts. Jaws 5" across that open up to full 5" wide. Horizontal V-grooves for holding rounds up to 2" in diameter. Built in parallels for locating flat or rectangular parts.

PRICE  
**\$17.00**

**LAWRENCE H. COOK, INC.**

65 MASSASOIT AVENUE  
EAST PROVIDENCE 14, RHODE ISLAND

## ELK UNIVERSAL PRECISION TOOL HOLDER

**1**  
WILL  
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**10**

**SINGLE  
PURPOSE  
TOOL HOLDERS**



Round boring bars and internal threading tools can be used in the same tool holders.

Write for Bulletin

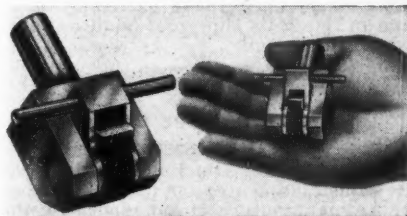
**ELK TOOLS, INC.**

73 West Broadway New York 7, N. Y.



## Acromark Small Numbering Machine

A small, proportionately built automatic numbering machine for fine consecutive numbering on watch and deli-



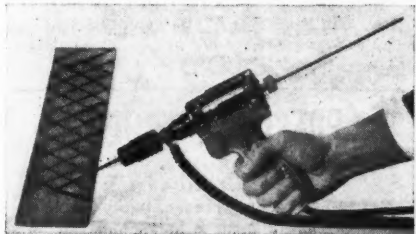
Acromark Small Numbering Machine

cate instrument parts is announced by The Acromark Co., 9 Morrell St., Elizabeth 4, N. J. According to the manufacturer, the machine is built proportionately and increases or decreases in body size in proportion to the size of characters and number of wheels.

As shown in the accompanying illustration, a 6-wheel consecutive or repeat action numbering machine for numbering precision steel instrument parts with 1/20-inch figures has a body size of 1 1/4 x 1 3/8 x 1 1/8 inches exclusive of the shank and is so small to fit into the crippled palm of the hand.

## "Ruf-Tred" Tool

Designed to provide a simple economical method for preventing slipping

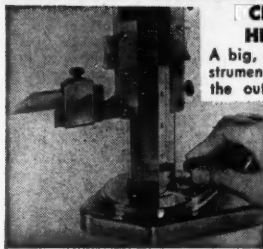


"Ruf-Tred" Tool

and falling accidents on smooth steel or iron surfaces, a vibrating electrode holder which can be used with either a.c. or d.c. welding machines to deposit hard

## SCHERR aids to precision — production

### CHESTERMAN HEIGHT GAGE



A big, sturdy stabilized instrument which can double the output of your skilled toolmakers. Fine adjustment by screw operated from knurled nut on base eliminates all rocking or shifting instrument while measuring. Finger pressure on two

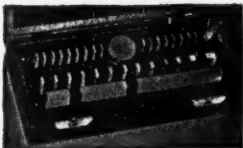
lugs frees split nut for rapid up or down adjustment. 2 1/2" long vernier in place of the normal 1/2" vernier gives greater visibility without the need of magnifier or removing gage from work. Both English and metric readings on column. Made in sizes from 12" to 48"—capacities sufficient for the most unusual measurements.

### OPTI-FLAT GLASS SURFACE PLATE



Here is the basis for vertical measuring accuracy — an optically ground glass surface, flat within 50 millionths over the total area. A solid, non-warping thick disc of Pyrex brand glass, set in a heavy wood base with dust-proof cover. Immune to the internal strains which may affect the accuracy of metal surface plates, with the added advantage that accidental scratches cannot cause raised burrs, nor usage wear the hard surface. For real accuracy in layout work and critical inspection. Two sizes—12" diam., 2" thick \$58, and 16" diam., 3" thick \$88. Also a complete stock of hand-scraped metal surface plates, angle irons, measuring irons, etc.

### ULTRA-CHEX GAGE BLOCKS



Sets in size for all budgets. All blocks accurate to five millionths. Illustrated is the 34-block set, giving 80,000 combinations in steps of 1/10,000", with optical flat for checking wear. Low prices allow for constant practical shop use in setting tools, checking gages, locating holes in jigs and fixtures, etc. Many shops use a number of sets, with one master set for reference. 9-block set, \$27.50; 34-block set, \$125.

Write for full details on these tools and for the Scherr Small Tool Catalog.

**GEO. SCHERR CO., Inc.**

198-A Lafayette St. New York 17, N.Y.

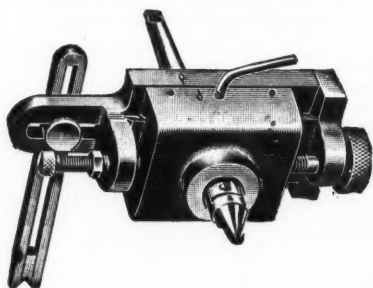
rough bead lines approximately  $\frac{1}{8}$  inch wide x  $\frac{1}{8}$  inch high, to be known as the "Ruf-Tred" Tool, is announced by the Metallizing Engineering Co., Inc., Safety Products Division, 38-14 30th St., Long Island City 1, N. Y. On a large area, the bead lines are usually spaced several inches apart and arranged in a geometrical pattern such as diamonds. On a small area like the nosing of a stair tread, several closely spaced parallel bead lines are usually deposited.

In operation, the end of the electrode is placed in contact with the surface to be roughened and drawn along at a speed

of approximately 5 feet a minute. According to the manufacturer, it is not necessary to "hold" an arc, as in welding, since the vibrator causes intermittent arcing, which melts the end of the hard steel electrode and fuses the molten droplets to the base. The deposited metal is claimed to be extremely hard and to retain its slip-proof qualities even when wet or oily.

### Douglass Taper Cutting Attachment

A taper cutting attachment with quickly adjustable center for use with lathes of its manufacture is announced by the



Douglass Taper Cutting Attachment

Douglass Distributing Co., 3615 S. Grand Blvd., St. Louis 18, Mo. Finely machined and extremely accurate, the attachment, it is claimed, is available in Nos. 2 and 3 standard Morse taper shanks.

To use, the Douglass Taper Cutting Attachment is simply inserted in the lathe tailstock and the work lined up by normal methods for taper cutting.

## CAMS

Our ROWBOTTOM cam cutting facilities are at your disposal for your cam requirements.

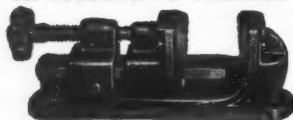
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**BLOOMFIELD TOOL CORP.**

37 FARRAND ST. BLOOMFIELD, N. J.

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Surface plates, angles, and parallels — all of sturdy construction and exact dimensions. Used wherever precise measuring needs must be met.



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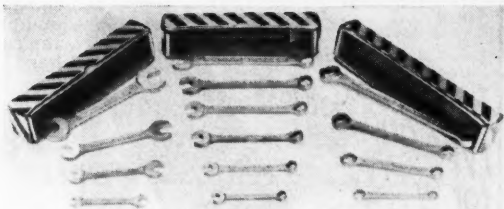
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Engineers and Machinists  
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(Left) Plomb Open End Wrench Set No. 3000BA, (Center) Combination Wrench Set No. 1200BA, and (Right) Box Wrench Set No. 1100BA



When the taper cutting operation is completed, the attachment can be readily removed, thus making the lathe ready for straight turning operations.

### Plomb End Wrench Sets

Three basic end wrench sets providing the most-used opening sizes have been announced by the Plomb Tool Co., Los Angeles 54, Calif. Set No. 3000BA includes four open end wrenches with openings of  $\frac{1}{4}$  and  $\frac{5}{16}$ ,  $\frac{3}{8}$  and  $\frac{7}{16}$ ,  $\frac{1}{2}$  and  $\frac{9}{16}$ , and  $\frac{5}{8}$  and  $\frac{3}{4}$  inch.

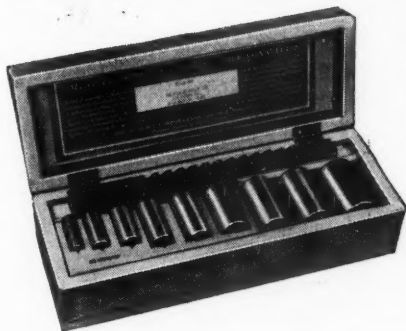
Set No. 1100BA includes four box wrenches with 12-point box openings of  $\frac{1}{4}$  and  $\frac{5}{16}$ ,  $\frac{3}{8}$  and  $\frac{1}{2}$ ,  $\frac{1}{2}$  and  $\frac{9}{16}$ , and  $\frac{5}{8}$  and  $\frac{3}{4}$  inch. Set No. 1200BA includes six combination box and open end wrenches with openings of  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{9}{16}$ ,  $\frac{1}{2}$ ,  $\frac{9}{16}$ , and  $\frac{3}{4}$  inch. Each combination wrench has both an open end and a 12-point box opening of the same size.

### Corundum Jewel-Tipped Dial Indicator Gage Contact Point

A dial indicator gage contact point with sapphire or ruby tip is announced by the Corundum Co., Inc., 1777 E. 87th St., Cleveland 6, Ohio. The point is made with a hexagonal buffed stainless steel body 0.187 inch across flats and 0.437 inch long overall with 0.187-inch point radius and is cemented and spun into the body and given a high polish.

The Corundum Jewel-Tipped Contact Point is designed to fit practically all bench types of indicators and may be installed by hand or with a small wrench. Points with special threads are also available. According to the manufacturer, the jewel-tipped contact point cannot

## THIS KIT BELONGS IN YOUR SHOP



With it you can cut keyways by hand *in one minute* in gears, cutters, couplings, collars, pulley hubs, etc.

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The FELL Precision Level is made to show the level of all ways at once. This eliminates disturbing the first level when leveling the second. Graduations are in .0005" per foot and form squares about a circular bubble, thus giving co-ordinate readings and showing direction and amount of slope, if any.

**MADE IN TWO SIZES**

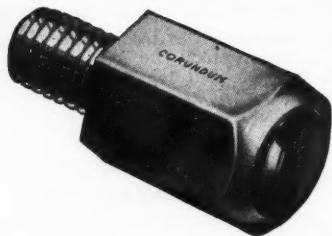
5 1/2" x 12"      3 1/2" x 6"

Write for Bulletin

**WM. B. FELL CO.**

1403 PRESTON ST., ROCKFORD, ILL.

scratch or mar work or pick up metals, and provides for extremely long life since the ruby or sapphire tip employed is very hard (9 on Moh Scale) and of high

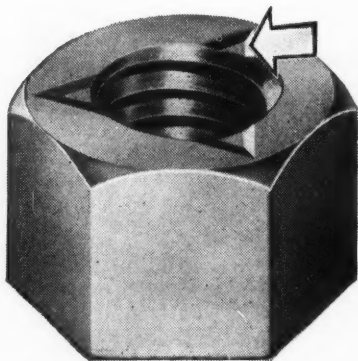


Corundum Jewel-Tipped Dial Indicator Gage Contact Point

density (3.9). When worn, the point may be returned to the company for repolishing.

### Gripco Improved Lock Nut

The Grip-Nut Co., 308-F S. Michigan Ave., Chicago 4, Ill., announces an improved design of its semi-finished one-piece self-locking Gripco Lock Nut which is believed to still further widen its field



Gripco Improved Lock Nut

of general industrial use. The principal improvement consists of widening and deepening the original triangular deflections at the top of the nut. This improvement is said to result in three marked advantages: (1) provides considerably

greater flat area depression of threads, thus affording greater sustained holding power; (2) makes it possible for the lock nut to be removed and reapplied many more times and still retain a high locking value; and (3) provides for effective locking of the nut on threads not held to close tolerances.

Available in a variety of standard sizes, the Grieco Improved Lock Nut, according to the manufacturer, requires no lock washers or cotter pins; a wrench is all that is needed to apply or remove it. The locking action of the nut is claimed to be unaffected by oil, water, or chemicals.

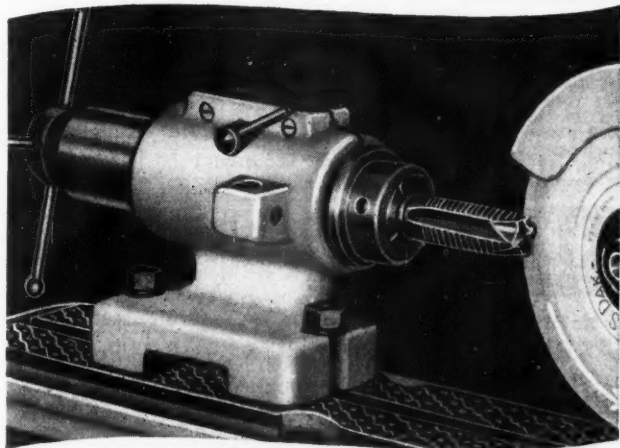
### U. S. Single Blade Expansion Reamer

Said to entirely eliminate the cut-and-try method of reaming, a single blade expansion reamer which is designed to ream exact diameter holes to accommodate almost any size of soft metal bearings, including piston pins, has been announced by the U. S. Reamer & Tool Corp., 124 S. Isabel, Glendale 5, Calif. The reamer is supplied complete with standard and oversize ring gages. After selecting the desired size of ring gage, it is slipped



U. S. Single Blade Expansion Reamer

over the reamer, which is used in the usual manner; however, when the bearing has been reamed to the proper size,



**SAVE  
TAPS**  
with a  
**"K.O."**  
**Tap  
Grinding  
Fixture**

Recondition broken taps—sharpen dull taps, from #7 to 2½". Fits any cutter grinder. Mail Coupon TODAY for illustrated bulletin.

**K. O. LEE CO. 1114 1st Ave. S. E., ABERDEEN, S. D.**

the ring gage is said to prevent further expansion, thus enabling an accurate fit to be obtained.

In addition to the Tru-Size ring gages, the U. S. Expansion Reamer is equipped with a tungsten-carbide blade which is said to produce a highly accurate ream finish and last indefinitely. In operation, the reamer sleeve is first expanded inside the bearing, thus providing a positive support. The blade is then advanced and, as metal is removed, the sleeve is expanded to hold the bearing in accurate alignment. The reamer is made in 32 standard sizes of from  $\frac{1}{16}$  to  $\frac{3}{8}$  inches.

**GRIND IT on Your Lathe**



A powerful External Grinding Attachment for sharpening reamers and cutters, grinding hardened bushings, etc. Has precision ball bearing spindle with 4" x 1/2" grinding wheel. 5 sizes for South Bend Lathes—adaptable to others. Write for dimension sheet. Price with 1/4 h.p., 1 ph. motor, f.o.b. factory . . . . \$49

**SOUTH BEND LATHE WORKS** 427A E. Madison St. South Bend 22, Ind.

**SAVE FLOOR SPACE LIFTING**



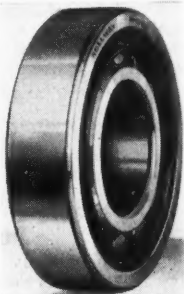
Yohe racks save floor space, hold more stock, require less lifting. Capable of holding 10,000 and 12,000 pounds for bars 10 to 20 feet long.

**Write for details.**

**WM. S. YOHE SUPPLY CO.**  
505 GIBBS AVE., N. E. CANTON, O.

## Rollway "Tru-Rol" Cylindrical Roller Bearing

The Rollway Bearing Co., Inc., Syracuse, N. Y., announces a precision cylindrical roller bearing with steel retainer, to be known as the "Tru - Rol." The one-piece steel retainer includes pockets having deep broad double angles or guide lips in which the rollers are kept in alignment to ensure long life by the correct guiding of the rollers. Additional bearing components include the outer race with deep accurate ring grooves in the inside diameter into which fit the heavy substantial snap rings that retain the roller retainer and rollers in the outer race which make up the roller assembly. The inner race is interchangeable.



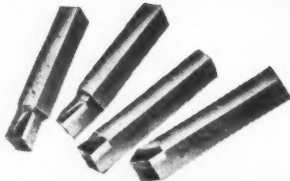
Rollway "Tru-Rol" Cylindrical Roller Bearing

The Rollway Tru-Rol Cylindrical Roller Bearing is manufactured in a range of sizes conforming with S.A.E. standards for roller bearings. The BE-1200 and BE-1300 series correspond to the single row type of the 200 and 300 size respectively. The BE-5200 series corresponds to the wide type. The Tru-Rol Bearing may be applied using the inner race or without the inner race, depending upon the application required.

### Series M Center Scope

Having a body length of  $2\frac{3}{4}$  inches overall and a shank diameter of  $\frac{3}{8}$  x 1 inch long, the Series M Center Scope

## BARGAINS IN CARBIDE TIPPED TOOL BITS . . . 80¢ Each



### HIGHEST GRADE TUNGSTEN CARBIDE ONLY!

Sizes  $\frac{1}{4}$ ",  $\frac{5}{16}$ ",  $\frac{3}{8}$ ",  $\frac{7}{16}$ ",  $\frac{1}{2}$ "

- Available in any size, any shape, at 80¢ each in Right Hand, Left Hand, Round and Square Nose

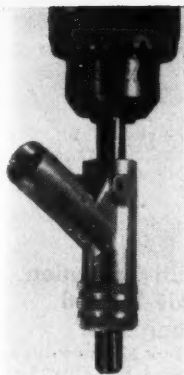
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Illustrates complete machine shop equipment.

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Series M Center  
Scope

shown in the accompanying illustration is announced by Center Scope Products, 3829 San Fernando Rd., Glendale 4, California.

Designed to provide for advantages of minimum weight and overhang, the instrument is claimed to feature maximum accuracy, high magnification, and simplicity, and can be used for precision locating purposes on lathes, drill presses, jig borers, and vertical boring mills.

### Wilson No. 109 Arc Welding Electrode

The availability of an all-purpose arc welding electrode for the welding of mild steel has been announced by the Wilson

Welder and Metals Co., Inc., Dept. 1778P, 60 E. 42nd St., New York 17, N. Y. Designated as the No. 109, the electrode is available in diameters of  $\frac{1}{8}$ ,  $\frac{3}{32}$ ,  $\frac{1}{4}$ ,  $\frac{5}{32}$ ,  $\frac{3}{16}$ , and  $\frac{1}{2}$  inch.

According to the manufacturer, the Wilson No. 109 Electrode maintains a high degree of welding performance throughout the entire length of the electrode when high welding currents are used. The electrode is said to operate satisfactorily in all positions, especially when welding vertically down. Excellent operating characteristics with a minimum of spatter are claimed to be obtained with either a.c. or d.c. The deposited bead is described as strong, smooth, and of proper contour. Slag is claimed to be unusually easy to remove.

### Palmer-Shile All-Steel Storage Bin

Designed with a four-way entrance for use with a hand, power lift, or fork truck, a storage bin of all-steel construction has been developed by the Palmer-Shile Co., 16022 Fullerton Ave., Detroit 27, Mich. The bin, which can be tiered with a portable elevator, high lift or fork truck, can also be built with crane lugs for use with an overhead hoist.

## HI-LO VARIABLE SPEED PULLEYS

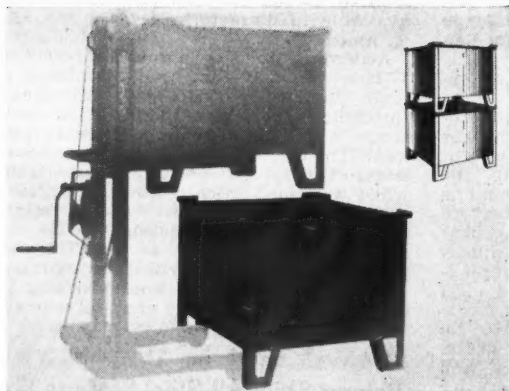
• Hi-Lo Variable Speed Pulleys give infinite variable speed on any constant speed motor. Using standard V-belts, they maintain constant speed at any set point, no matter how the load varies and automatically regulate belt tension to the load. This is accomplished by a cam action within the Pulley, eliminating heavy springs and prolonging belt life. Hi-Lo Pulleys can be conveniently installed on machines already in service or incorporated into new ones. Furnished from fractional up to 5 HP, they will give a thousand speeds with any constant speed motor.

## EQUIPMENT ENGINEERING CO.

2853 COLUMBUS AVE. SO.

•

MINNEAPOLIS 7, MINN.



Palmer-Shile All-Steel Storage Bin

sions of 36 inches long x 36 inches wide x 24 inches deep and weighs approximately 210 pounds.

### Cook Multi-Operation Carbide-Tipped Cutting Tool

The R. F. Cook Manufacturing Co., 2732 Second St., Cuyahoga Falls 12, Ohio, announces a multi-operation carbide-tipped cutting tool, which is said to be capable of (1) chamfering a small bore, (2) reaming a step, (3) reaming a diameter, (4) chamfering a diameter, (5) reaming a counterbore diameter, and (6) chamfering a counterbore diameter. All of these operations are said to be accomplished with one tool simultaneously.

The particular tool shown in the accompanying illustration is designed to chamfer, ream, and counterbore master

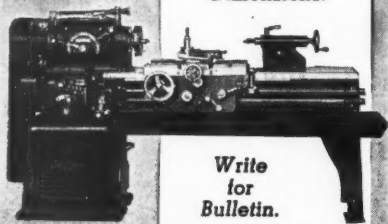
Said to provide a practical means for conveniently storing small parts in a limited floor space, the Palmer-Shile Storage Bin is constructed of heavy steel plate with legs and corner reinforcements of angle iron and sturdy corner plates for stacking. The top edge of the bin is flanged all the way around to provide extra strength. The unit has inside dimen-

**CARROLL  
AND  
JAMIESON  
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**16"**

12 Speed Geared  
Head Motor Drive  
Timken Mounted  
Spindle.

Modern Design—  
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### CENTERLESS

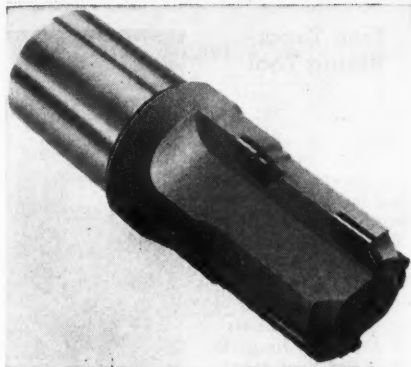
**Polisher • Buffer • Surfacar**

and vertical or horizontal belt grinder, with centerless feed are all combined in the "PRODUCTION" TYPE S machine. Ideal for cylindrical polishing or straight line finishing on flat work. Can be used for anything that can be ground or polished — metals, rubber, fibre, wood, etc.

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**PRODUCTION MACHINE CO.**

**GREENFIELD, MASS.**



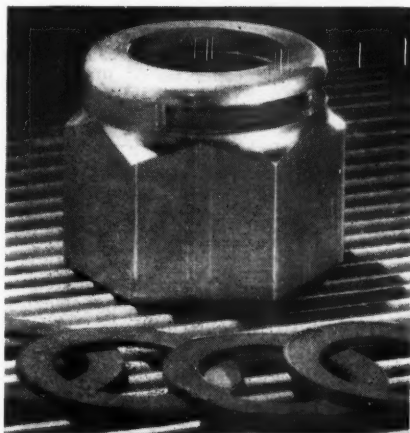
**Cook Multi-Operation Carbide-Tipped Cutting Tool**

cylinders for automotive type brakes. Similar tools, carbide tipped, can be supplied in various shapes and sizes for use in performing operations on numerous other industrial products where maximum production and speed and minimum downtime are required.

### **Swallow Lock Nut with Replaceable Locking Unit**

A lock nut with replaceable locking unit which may be used with either fiber or

**Swallow Lock Nut with Replaceable Locking Unit**



**"THERE JUST ISN'T ANY  
'ONE-SHOT' CUTTING FLUID"**



*...says*  
**"CHIP" WRIGHT**

I've seen more than one man who thought he had a cutting fluid that could be used for everything. But, it just doesn't work that way. When you overdo standardization or simplification, trouble develops. Speeds, feeds, materials, tolerance and finish requirements all help determine the correct cutting fluid for the job. That's why I've found it best to rely on the recommendations of experienced cutting people. It's false economy to over-standardize or over-economize when it comes to cutting fluids."

*—Chip*

D. A. Stuart Oil Co. can help you solve your machining problems, eliminate headaches. Write for the Booklet "Cutting Fluids for Better Machining."



**D. A. Stuart Oil co.**  
EST. 1905 LIMITED

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metal washers, thus allowing the use of the nut where resistance to heat is essential, has been developed by the Swallow Airplane Co., Wichita, Kan. The full holding strength of the lock nut can be readily restored by replacing, without tools, the locking unit retained in the crown of the nut, thus providing for maximum economy.

The lock nut with replaceable locking unit can be produced in a wide variety of sizes for use in the aircraft, automotive, farm machinery, locomotive, heavy equipment, and other building and servicing industries.



### WIRE ROPE CUTTER No. C

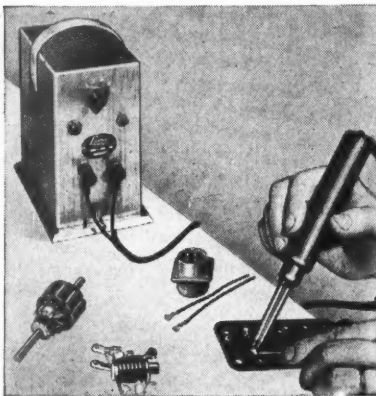
Hand Operated.

Price \$112.50. Wt. 110 lbs.  
Lever Action.

Made in two capacities:  
One for 1" and smaller wire rope. One for 1 1/4" and smaller wire rope.

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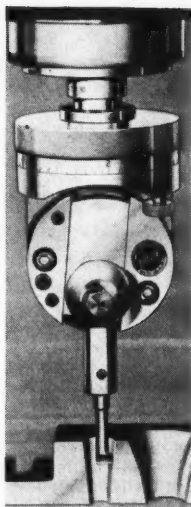
The Luma resistance method of soldering is the accepted way for small shops requiring single operation to large plants with many types of operations. Write for complete information about this remarkable tool.

**LUMA ELECTRIC EQUIPMENT CO.**  
P. O. Box 137-M.S. Toledo 1, Ohio

### Tree Taper-Boring Tool

A taper - boring tool which is designed to fit all milling machines, jig borers, and boring bars is now being produced by the Tree Tool & Die Works, Racine, Wis. The tool, which measures 4 inches in diameter x 5 inches long, is made of heat treated precision ground alloy steel for long life, strength, and accuracy. Its simplicity of operation and adaptability are said to make the tool useful for boring metal patterns, die-cast dies, rubber or plastic molds, drop forge dies, and a variety of other products.

The Tree Taper-Boring Tool can be used in boring tool steels, cast iron, and non-ferrous metals. In one setup, straight boring, facing, and outside turning, either straight or taper, can be performed, in addition to taper boring. The work need not be moved since all adjustments can be quickly and easily made on the tool. By setting the graduated swivel base to the desired angle, swinging the boring bar into cutting position, and holding the knurled ring stationary as the tool revolves, the unit can be used to bore holes to any desired taper up to 10 inches in diameter.



Tree Taper-Boring Tool

### TAPERED SPIRAL END MILLS



For Clearance on Dies, Molds, Patterns.  
Tapers 1/2° to 7°. Flute length 1/2" to 3 1/2". Dealer Inquiries Invited.

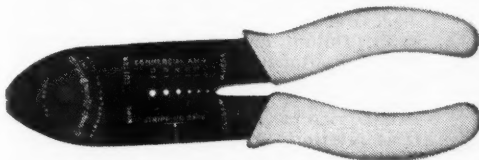
Write for catalog.

**Cadillac Cutter Co.**

1611 Eastern S.E. Grand Rapids 7, Mich.

## AMP "Yellow Jacket" Combination Wire Stripper and Cutter

A pocket-size wire stripper and wire cutter for wire sizes 22 to 10 has been announced by Aircraft-Marine Products,



AMP "Yellow Jacket" Combination Wire Stripper and Cutter

Inc., 1583 N. Fourth St., Harrisburg, Pa. Known as the AMP "Yellow Jacket" because of its distinctly colored shockproof plastic handles, the tool incorporates a built-in wire cutter, serrated plier jaws, and a handy stud size gage. The accurately sized stripping notches are also designed to serve as a convenient wire size gage.

## Alpha Tri-Core "Leakpruf" Acid-Filled Solder

The Solder Division, Alpha Metals, Inc., 363 Hudson Ave., Brooklyn 1, N. Y., announces the development of Alpha Tri-Core "Leakpruf" Acid-Filled Solder, which can be used in soldering stainless steel, Monel, nickel, and other metals. According to the manufacturer, the synthetic acid used is readily active as a flux yet has a minimum corrosive effect. Furthermore, it is said to be readily soluble in water.

A definite soldering sequence is claimed to be automatically developed by three cores of flux; thus, "cold solder joints" are practically eliminated. The proper volume of flux is said to be present at the moment the acid begins to flow to assure an excellent bond. The three core construction also promotes fast melting.

Alpha Leakpruf Tri-Core Solder is packaged in 1, 5, and 20-lb. spools. The first two are shipped in 50-lb. cartons, 50 and 10 spools to a carton, respectively. The 20-lb. spools are shipped 2 and 3 to a carton.

## BALDOR BALL BEARING GRINDERS

**A Complete Line**  
— 6" to 12" wheels —  
**BENCH and PEDESTAL TYPES**

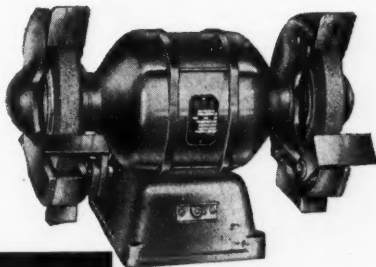
**Rugged---for heavy-duty service**  
**Precision-built for precision work**

BALDOR Grinder No. 8100 series, (shown here) has powerful  $\frac{1}{2}$  h.p., ball-bearing motor, 1700 rpm., 1-phase, 3-phase and D.C. 8" x 1" fast cutting, balanced wheels. 1-YEAR GUARANTEE..... **\$74.00**

**PROMPT SHIPMENT — ALL SIZES**

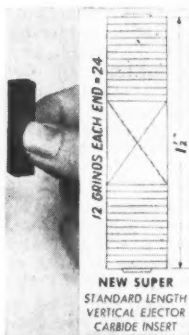
**BALDOR ELECTRIC COMPANY**  
4380 Duncan Ave., St. Louis 10, Mo.

**ASK FOR BULLETIN 321-C**  
**ON COMPLETE LINE**



## Super Ejector Tool Carbide Insert

The Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich., announces that its



standard vertical ejector carbide tool bits, including the square, round, triangular, and rectangular shapes, are now each being offered with a carbide insert  $1\frac{1}{2}$  inches long as standard equipment. The unusual length of the carbide insert is said to provide for a maximum number of additional grinds under normal conditions of use.

### Super Ejector Tool Carbide Insert

According to the manufacturer, the Super Ejector Tool Carbide Insert can be obtained in a variety of grades and manufacture to meet particular requirements and conditions as specified by the user.

**Uniform Accuracy**

This dominant factor for extra savings in assembly time and cost is a part of every piece that makes up the complete line of Screw Machine Products

SET SCREWS  
CAP SCREWS  
COUPLING BOLTS  
MILLED STUDS  
In all sizes and threads

PRECISION MILLED by

**Ottomiller**  
WILLIAM H. CO.  
York, Pennsylvania

## New Books

**"Developing Public and Industrial Relations Policy."** Three aspects of the development of public and industrial relations policy — labor relations, planning and research for top management, and the methods of policy formation — are discussed in a 52-page pamphlet, "Developing Public and Industrial Relations Policy," published by the American Management Association. Authors contributing to the volume include John A. Stephens, vice president in charge of industrial relations, United States Steel Corporation of Delaware, Pittsburgh, and AMA vice president in charge of the Personnel Division; Rodney Chase, director of public and industrial relations, Chase Brass and Copper Company, Waterbury, Connecticut; Leroy H. Kurtz, department of public relations, General Motors Corporation, New York; and H. W. Nourse, vice president, economic controls, United Air Lines, Inc.

Mr. Stephens analyses the necessity of solving the economic problems of major industries in terms of public welfare. Mr. Chase advances the proposition that management's public relations influence management's industrial relations but

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Cut KEYWAYS Safely with **The GLENNY** Adjustable Expansion **PUSH BROACH**

- ★ Safe from rejects thru error—the Glenny assures maintained accuracy on all work.
- ★ Safe from rejects due to scoring of the bore.
- ★ Safe from blade breakage because sleeve of broach protects blade when tool is under pressure.
- ★ Safe for operator—sleeve acts as guard—unprotected, unsupported blades become a hazard to face and body of operator when cutting pressure is applied.

NOW—NEW GLENNY BUSHINGS ADAPT STANDARD GLENNY BROACHES TO MANY NEW TIME AND MONEY SAVING OPERATIONS

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both are clouded by unawareness of fundamental economic facts and are confused by the semantics of languages used in labor-management discussions. Mr. Kurtz contends that policy as the conscience of business must be open to a "free two-way flow of ideas and dynamic comprehension." He sets forth methods of determining policy used by General Motors. Mr. Nourse describes his company's consolidated organization for special research as a basis for top management decision.

The pamphlet, No. 140 of AMA's General Management Series, is available from the American Management Association, 330 W. 42nd St., New York 18, N. Y., at \$1.00 per copy.

American Standard Safety Code for Power Presses and Foot and Hand Presses B11.1 (1948). Nine years of experience have been drawn upon in preparing a completely revised edition of the American Standard safety code for the protection of employees using power presses and foot and hand presses. This revision of the 1937 edition was prepared by a nationally representative sectional committee organized under the procedure of the American Standards Association and sponsored by the National Safety Council. It includes up-to-date nationally acceptable recommendations for the safe installation of power presses, as well as a wide variety of guards and feeding methods for all types of power presses

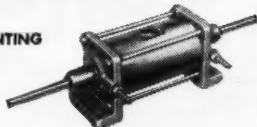
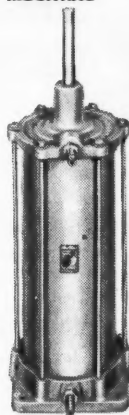
and foot and hand presses. It also makes recommendations for safe operating conditions.

One of the important changes in the new edition is the lowering of the size of the openings nearest the nip point in fixed barrier guards from  $\frac{3}{8}$  inch to  $\frac{1}{4}$  inch. In addition, the "minimum plunger travel" type of guarding has been struck from the code. A complete table of permissible openings is now included in the standard. Requirements for gate guards, two-hand tripping devices, pull-out guards, electronic safety devices, sweep guards, and various other types of guards

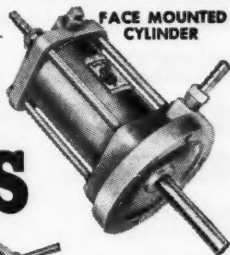
## DOUBLE-ACTION AIR CYLINDERS

HORIZONTAL MOUNTING

VERTICAL MOUNTING



FACE MOUNTED CYLINDER



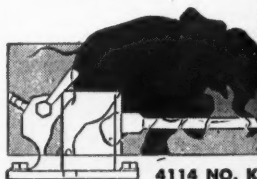
SUSPENDED OR SWIVEL MOUNTING



Mounting	Bore				
Horizontal	1 1/2"	2 1/4"	3"	4"	5"
Vertical	.....	2 1/4"	3"	4"	5"
Face	.....	2 1/4"	3"	4"	5"
Swivel	.....	2 1/4"	3"	4"	5"

Length of stroke optional

The new Mead Air Power Catalog shows the full line of single and double-acting cylinders, and air-operated Presses, Vises, Chucks, Hammers, Work Feeders — for faster, money-saving production. Write!



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for protecting the operator are presented in the new edition.

In addition to the provisions in the standard proper, the appendix contains more complete discussions of the guards and lists the applications and limitations for each type so that the user may determine which would best serve him. This portion of the appendix is supplemented by pictures illustrating the text.

Since safety in the operation of power presses involves more than the use of proper guarding devices at the point of operation, one section of the standard is concerned with the requirements for

installation of the press. In addition, a few fundamental principles are recommended as the basis for the safe operation of power presses.

Copies of the American Standard Safety Code for Power Presses and Foot and Hand Presses (B11.1-1948) may be obtained from the American Standards Association, 70 E. 45th St., New York 17, N. Y., at \$1.25 each.

**"Trends in Retirement Planning."** A report of current thinking by management and labor on employee retirement

plans has been published by the American Management Association under the title "Trends in Retirement Planning." The 32-page publication discusses employee, company, and union attitudes on retirement plans and presents an analysis of trusted plans, insured plans, and methods of achieve lowered premium costs.

Authors include Ivan L. Willis, vice president, International Harvester Company, Chicago; Esmond B. Gardner, vice president, Chase National Bank, New York; Maurice F. Lipton, director, group annuities, Equitable Life Assurance Society of the U. S., New York; and John W. Culkin, vice president, Gurney Overturf & Becker, Buffalo.

"Trends in Retirement Planning," Insurance Series Number 73, is available from the American Management Association, 330 W. 42nd St., New York 18, N. Y., at \$.50 a copy.

**CAPACITY: FROM THE SMALLEST AND FINEST TAP**

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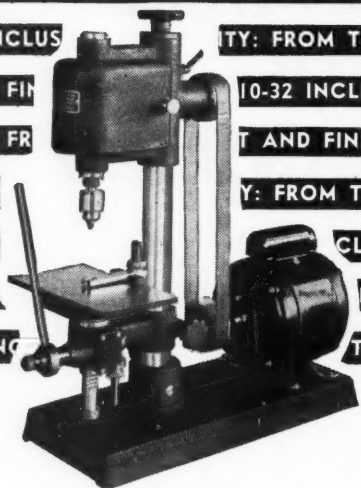
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When tapping operations must be precise, and the materials used differ in characteristics as widely as paper and monel, or ceramics and bronze; then the precision and instrument industries should specify, and demand, the

### **HAMILTON SUPER SENSITIVE TAPPING MACHINE**

Taps to the very bottom of blind holes. Reduces tap breakage to an absolute minimum. Built ruggedly . . . for fast and continuous service on tight production schedules.

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TAPPING MACHINES - PORTVELATORS

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Mention MODERN MACHINE SHOP when writing to advertisers.

**American Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels (B7.1-1947).** Changes to bring the American Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels into line with current practice have been made in a new edition approved recently by the American Standards Association. The new edition is a revision of the 1943 edition and was prepared by a nationally representative sectional committee under the procedure of the American Standards Association. Because of an increase in the use of small mounted wheels and points, two new tables have been added to the standard to cover critical speeds for wheels and points having  $\frac{1}{8}$ -inch spindles. Slightly higher speeds for Types 12 (dish wheels) and 13 (saucer wheels) are now permitted. Diamond wheels have been subdivided into different groups with different speeds allowed for each. These new speeds are provided because of changes in manufacture and use of diamond wheels which have taken place since 1943.

The rule governing minimum spindle diameters for various sizes of wheels has been changed so that the tables of spindle sizes are advisory rather than mandatory. This change was made because experience had indicated that machines with spindles smaller than the minimum specified in the tables had been found satisfactory for certain work for which they were designed and the rule has been amended to permit these special applications. The addi-

tions to the appendix, although containing no rules or specifications, include a set of sketches with notes describing the most common causes of failure of threaded hole wheels of the cone or plug types. Descriptions of an adapter type of mounting for cup wheels on portable grinders and of rubber faced protection washers are also included in the publication.

Copies of the American Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels (B7.1-1947) may be obtained from the American Standards Association, 70 E. 45th St., New York 17, N. Y., at 75 cents each.

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## GUN TYPE SAW



At last, a saw which cuts anything, stainless steel, rubber, wood, aluminum, etc. Blade has a variable speed which is set in 45 seconds . . . the stroke length of the blade is adjustable depending on thickness of materials. Transa has

twice the power on the cutting stroke due to a special gearing arrangement.

Special guides for each width of saw blade eliminate whipping, turning or cracking the blade, and acts as a cutting

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## TRANSA INC.

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Minneapolis, Minnesota

## New Shop Literature

**Lyon-Raymond Sheet and Strip Feeding Tables** are featured in a two-color bulletin released by the Lyon-Raymond Corp., 5145 Madison St., Greene, N. Y. The bulletin describes and illustrates new equipment which is available in capacities of 2,000, 4,000, and 6,000 lb. in single and double pedestal models. Practical applications and suggested uses for this equipment are outlined and specifications of the different models are listed. Copy of Bulletin 260 free upon request.

**"Quick Delivery"** is the title of an eight-page booklet released by The Hydraulic Press Mfg. Co., Dept. MMS, Mount Gilead, Ohio, which lists a number of hydraulic presses and machines as well as their components for unusually quick delivery. Among the H-P-M products described in detail are metal-working presses, die casting machines, plastic molding machines, turbojectors for rubber molding, laboratory presses, hydraulic boosters, gear pumps, power units, and variable delivery radial pumps. Among the surplus equipment

listed are hydraulic valves for water pressure service, miscellaneous valves, pumps, electrical equipment, and large cap screws in a variety of sizes. Copy is available free upon request.

# SMITITE DIAMOND

Tool life, speed of cut, increased production depend upon the diamond tool. Smitite Dressers contain a number of small, whole diamonds, which may be completely consumed without resetting. They are evenly distributed throughout the sintered matrix, permitting several stones to contact the wheel. There are many types for rough- or finish-grinding, on wheels of any size and hardness.

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129 Adelaide St. West, Toronto, Ont.

**Bellows Non-Rotating Air Motors**, available in four power rated sizes and with mountings to meet practically every mounting requirement, are featured in a 16-page three-color bulletin issued by The Bellows Co., Akron, Ohio. In addition to presenting complete illustrated and descriptive information on air motors, the bulletin also contains data on air motor accessories, such as pressure regulators, gages, air filters, air lubricators, valves, adjustable hydraulic resistance units, and so on. Copy of Bulletin BM-20 is available free upon request.

**Rigid Live Centers.** The Rigid Products Co., Dept. MMS, 16 Allen Ave., Cincinnati 15, Ohio, has published a four-page two-color folder which presents illustrated and descriptive information on the construction features of Rigid Live Centers, which can be obtained in standard or special designs, including types having female, pipe, and plain noses.

Tables giving dimensions and list prices of standard centers with Morse taper, straight, Jarno taper, and Brown & Sharpe taper shanks are included in the folder, in addition to illustrations showing typical applications of Rigid Live Centers. Copy free upon request.

**Matthews Rubber Stamps.** Publication of a 42-page catalog presenting data on rubber stamps and related items is announced by Jas. H. Matthews & Co., Dept. MMS, Pittsburgh 13, Pa. Covered are pencil top stamps; self-inking stamps; signature stamps; pocket stamps; stamp racks; stamp pads and inks; die plate daters; hand cushion daters; line daters; line, ledger, and special daters; line band numberers; special bands; self-inking daters; bronze plates, plaques, tablets, and memorials; time stamps; service daters; metal wheel daters; numbering machines; alphabet stamps; ribbon band price markers; type holders; logotypes; copy stamps; steel stamps; marking machines; stencils; stencil inks and brushes; embossing machines; and numerous other items. A price list for use with the

catalog is contained in a pocket on the inside of the back cover of the catalog.

Copy of Catalog 146-G is available to individuals addressing requests on their company letterheads.

**Norton "Norflex" Cut-Off Wheels,** made of tough sharp Alundum abrasive and a special resinoid bond and said to be especially suited for cutting off non-ferrous gates and risers on various foundry cut-off machines, are featured in a four-page folder published by the Norton Co., Worcester 6, Mass. Copy free upon request.

**1900 POWERFUL ROTARY IMPACTS PER MINUTE**

**Make it the ONLY all-purpose Electric Tool**

**AMAZING  
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ELECTRIC TOOL will**

- Drill up to 1/4" dia.
- Ream up to 1/4" dia.
- Tap up to 1/2" dia.
- Run Nuts up to 1/2" dia.
- Drive Screws up to 1/2" dia.
- Hole Saw up to 1 1/2" dia.
- Bore Wood up to 3/8" dia.
- Drive Studs up to 1/2" dia.
- Drill Masonry up to 1/2" dia.
- Extract Broken Studs up to 1/2" dia.
- Wire Brush up to 1/2" dia. shanks.

(Uses Standard Attachment)  
(110 V or 220 V Models available)

The tremendous power of the "rotary impacts" performs a multitude of operations not possible with any other electric tool. What's more remarkable—there is no kick—no twist to the operator.

The IMPACT Tool is the greatest labor-saving, time-saving portable power tool ever offered. It will save up to 90% of the time on nut running operations alone.

Call your Distributor now for a demonstration of this amazing all-purpose electric tool. They're available for immediate delivery.

**Ingersoll-Rand**

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239-18



**Sheffield High Speed Taps.** A 64-page handbook of tap data and catalog information on high speed commercial and precision ground taps, both standard and special, is announced by The Sheffield Corp., Dept. MMS, Dayton 1, Ohio. The catalog provides prices, discount and ordering information, tapping recommendations, specifications, and helpful reference data on taps, thread gages, thread checking instruments, self-opening die heads, and collapsible taps.

Copy of Catalog No. 48-3 is available to mechanical executives addressing requests on their company letterheads.

**Wilder Micro Projector.** The George Scherr Co., Inc., 198-A Lafayette St., New York 12, N. Y., announces the publication of a six-page folder fully describing Models A and B of the Wilder Micro Projector. The folder contains several illustrations showing the instrument in use and also features on its front page a very interesting illustration showing the highly diversified types of work that are regularly inspected and checked by means of the Wilder Micro Projector. Illustrated also are a number of accessories such as a micrometer cross slide, center support, surface illuminator, and

gear testing attachment, all of which constitute optional equipment. Copy free.

## CUT MILLING COSTS *with* KEMPSMITH STANDARD ATTACHMENTS

### SWIVEL VISE

Can Be Used on  
ANY Milling  
Machine



Kempsmith Swivel Vises are precision tools with operating surfaces accurately ground to size and squareness. Jaws are removable and coolant return channel cast integral. Built to take hard, everyday punishment. Plain vises and heavy duty plain and swivel vises, also available. Ask for Bulletin No. 117.

Kempsmith Standard Attachments broaden the scope of your milling machine . . . lower capital investment . . . save in set-up time.

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### KEMPSMITH ARBORS

in all popular  
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Adaptable to  
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milling machine with  
standardized  
spindle.

### "It Can Be Done."

The New Britain-Gridley Division, The New Britain Machine Co., Dept. MMS, New Britain, Conn., has released the first of a continuing series of cost histories prepared in folder form. Entitled "It Can Be Done," the folder presents actual cases of manufacturers having made a better product for less money by the use of improved methods of tooling and modern machines. The folder contains studies of multiple spindle chucking and screw machines and precision boring machines. More studies are in the process of being prepared and will be sent to subscribers at regular intervals.

A free copy of the folder "It Can Be Done," is available by writing to the sales engineering department of the above mentioned firm.

# KEMPSMITH

**Precision Built Milling Machines Since 1888**



**Kalamazoo Metal Cutting Band Saw** is the subject of a four-page two-color catalog issued by the Machine Tool Division, Kalamazoo Tank & Silo Co., 500 Harrison St., Kalamazoo, Mich. Models for wet and dry cut-off operations are shown and described. A table of specifications is also included. Copy free upon request.

**Nichols Miller.** The W. H. Nichols Co., Waltham 54, Mass., is now distributing a 12-page catalog which fully illustrates and describes its manually operated horizontal type precision milling machine. The several models in which the machine is available are covered. In addition, the catalog contains tabular information on the specifications of the Nichols Miller. Copy free upon request.

**"Grits and Grinds" Vol. 39, No. 2.** The second part of E. T. Larson's article on "Surface Grinding Troubles and Their Remedies" provides the lead feature in this edition of "Grits and Grinds," publication of the Norton Co., Worcester 6, Mass. Also contained in the booklet is an interesting illustrated article entitled "Abrasive Put Precision into Golf Clubs."

Copy of "Grits and Grinds" Vol. 39, No. 2 is available free upon request.

**"Counting Electrically and Photo-Electrically,"** a 16-page bulletin containing descriptions and illustrations of electric counter applications for counting parts, cartons, cases, boxes, and other items, as well as for mechanical operations, folding machine production, and so on, has been prepared by the Production Instrument Co., 702-12 W. Jackson Blvd., Chicago 6, Ill. Illustrations show both photo-electric actuation and operation with specially designed actuating switches. Copy of Bulletin ES-91 free upon request.

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Shop men all over the country have made it a habit to "SPECIFY PROCUNIER" when ordering tapping equipment. For over 30 years, Proconier tapping heads and machines have given them better service... faster tapping with less tap breakage!

Experienced craftsmen will take nothing less than the sensitive Proconier double-cone friction clutch; the heat treated Proconier gear mechanism which assures long, trouble-free life; the easier to handle "Tru-Grip" tap holder.

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*Safety Chuck Company*

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Gentlemen: Please send me your illustrated brochures which give complete prices and specifications on Proconier High Speed Tapping Heads and Machines.

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**Natco H-5 and H-6 Multi-Drillers and Tappers.** A 20-page illustrated bulletin with complete specifications on the new Natco H-5 and H-6 Multi-Spindle Drillers and Tappers is now available from Dept. 27, The National Automatic Tool Co., Richmond, Ind. Printed in two colors, the bulletin is completely indexed and contains all essential facts about both heavy-duty and standard H-5 and H-6 machines which make possible high-speed, sensitive, multi-hole production in small parts of steel, cast iron, plastic, wood, and aluminum. Copy of Bulletin 248 free upon request.



**Severance**  
CARBIDE **CHATTERLESS** HIGH SPEED  
**COUNTERSINKS**

- Shear cutting action
- Speedy—for air-tested seats
- Materials—up to 63-C hardness

17 stock sizes up to 2" diameter  
30° 41° 45° and 60° angles with C/L  
Shanks—plain, tang drive, tapers

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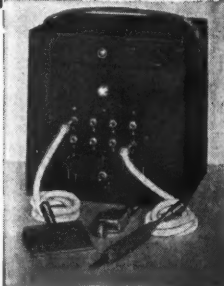
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WAY

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17 Washington St. Tenafly, N. J.



**Cushman Power Chucks.** Catalog PO-62 now available from The Cushman Chuck Co., Hartford 2, Conn., illustrates and describes power chucks with "Accralock" precision jaw adjustment feature. Copy free upon request.

**Bridgeport Time-Saving Set-Up Tools** for planers, drill presses, milling machines, grinders, and so on, are shown and described in a four-page pocket-size folder issued by the Hardware Sales Co., 1969 North Ave., Bridgeport, Conn. Tools covered include table jacks, adjustable table straps, and adjustable ladder blocks. Prices of the various tools are given. Copy free upon request.

**"Accurate Centering Faster without Scribing, Measuring or Trouble"** is the title of a six-page pocket-size two-color folder prepared by Universal Transfer Punch, Inc., Dept. M, Box 412, Massillon, Ohio, which illustrates and describes a convenient and economical tool for transferring centers from a single pattern or template to any number of duplicates. List prices are included. Copy free upon request.

**Super Ejector Type Tools.** An application manual covering 20 styles of ejector type tools, including the sizes in which they are available and prices, has been prepared by the Super Tool Co., Dept. MMS, 21650 Hoover Rd., Detroit 13, Mich. The manual describes both horizontal and vertical types, illustrates the variety of cuts possible with standard and special designs, and includes grinding instructions. Copy of Manual 348 free upon request.

**10 Models**

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3/8" to 1 1/2" bar capacity. 1/2" to 12" diameter holes. Built-in micrometer offset.

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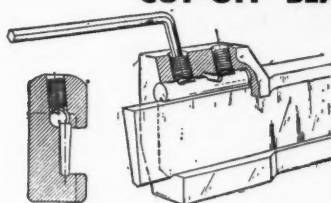
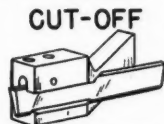
**Trico Renewable Fuses.** A four-page bulletin issued by the Trico Fuse Mfg. Co., Milwaukee 12, Wis., presents illustrated, descriptive, and tabular information on fuses with custom-built time-lag "powder-packed" renewable elements. A table listing standard sizes of fuses, voltages, amperages, and prices is included. Copy of Bulletin No. 1-B free.

**Janette Motorless Speed Reducers.** A price list of Type W motorless speed reducers has been prepared by the Janette Manufacturing Co., 556-558 W. Monroe St., Chicago 6, Ill. The price list contains up-to-date information on motorless, worm and worm and planetary gear speed reducers for moderate and low speed applications requiring from 1/20 to 10 h.p. Motorized speed reducers from 1/20 to 7½ h.p. with output speeds from 431 to 0.05 r.p.m. are also shown in the price list. Copy of Price List 10-27 free upon request.

**Brown & Sharpe End Mills.** Publication of a 24-page pocket-size catalog listing its complete line of end mills is announced by the Brown & Sharpe Manufacturing Co., Dept. MMS, Providence 1, R. I. Covered are spiral end mills; fast spiral single-end end mills; long, fast spiral single-end end mills; extra long, fast spiral single-end end mills; fast spiral double-end end mills; long, fast spiral double-end end mills; two-flute small helix angle spiral end mills; two-flute fast spiral end mills; two-flute fast spiral single-end end mills; long, two-flute fast spiral single-end end mills; two-flute fast spiral double-end end mills; long, two-flute fast spiral double-end end mills; and ball end, two-flute fast spiral single-end end mills. Copy free upon request.

"A Better Grip on Production" is the title of an eight-page two-color catalog released by the Forst Brothers Manufacturing Co., Dept. MMS, 259 N. California Ave., Chicago 12, Ill., which fully illustrates and describes "Levermatic" and "Handmatic" Collet Chucks for use on engine, toolroom and turret lathes, milling machines, drill presses, and grinders for gripping work internally or externally. Accessories, such as indexing and stationary fixtures and stops, are also shown and described. Copy free upon request.

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### FEATURING:

Bulldog H.V. cut-off blades, for longest tool life of any high speed steel. These blades, Rockwell's over 67C, contain 1.5% carbon, 5% vanadium and other alloying elements including cobalt.

### HOLDER ADVANTAGES:

(1) Rigidity. (2) Blade vertical-equal side clearance. (3) Cuts off straight to close tolerance. (4) Redressed blade re-locates within .0001". (5) Always holds blade at 90° angle to the work. (6) Blade is virtually "chucked" into place with maximum support over an extended portion of the blade right up to the nose of the holder.

Write for illustrated booklet MMS.



**R & D TOOLHOLDER CORP.**  
62 RYLE AVENUE PATERSON 2, N. J.

**Ideal Electric Etchers.** A six-page pocket-size folder now available from Ideal Industries, Inc., 1031 Park Ave., Sycamore, Ill., illustrates and describes electric etchers for permanently marking tools, parts, materials, and so on. Also shown and described are a soldering tool, industrial cleaner, live center, electric tachometer, dust collector, and demagnetizer. Copy free upon request.

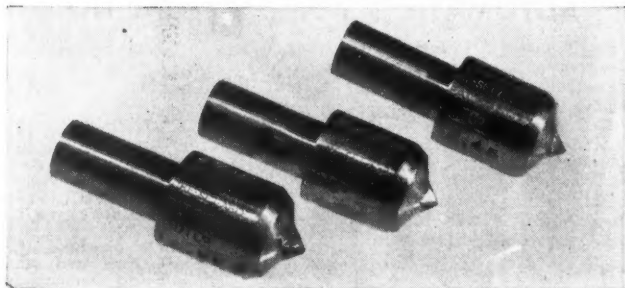
**Schauer Speed Lathe Catalog 480.** A 32-page catalog issued by The Schauer Machine Co., Dept MMS, 2060 Reading Rd., Cincinnati 2, Ohio, illustrates and describes the company's complete line of speed lathes designed for secondary finishing operations on small metal and plastic parts. The catalog details applications of individual types and sizes of speed lathes for polishing, lapping, filing, and deburring a wide variety of work ranging from screws and studs to gears, pulleys, dies, and large stainless steel bowls. A complete description and specifications of each type of speed lathe are presented.

Copy of Catalog 480 is available to individuals addressing requests on their company letterheads.

**"Trowel-In,"** a complete unit 18-hour floor-patch and resurfacer, is described in a four-page illustrated folder issued by the Flexrock Co., Dept. MMS, Filbert and Cuthbert Sts., Philadelphia 4, Pa. Copy free upon request.

**Nicholson Industrial Steam Trap.** A 12-page bulletin issued by W. H. Nicholson & Co., 136 Oregon St., Wilkes-Barre, Pa., presents illustrated, descriptive, and tabular information on a complete line of steam traps recommended for a wide variety of applications in various industries. Data on traps of bronze, cast iron, and cast steel construction are presented. Copy of Bulletin No. 1047 free.

**Mico Model 252 Two and Three-Dimensional Engraver** for a wide range of routine production and experimental jobs is illustrated and fully described in an eight-page two-color catalog issued by the Mico Instrument Co., 80 Trowbridge St., Cambridge 38, Mass. Various attachments and accessories available for the unit are also shown and described. Copy free upon request.



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**Moore "Panto-Crush" Wheel Dresser**, a two-in-one dressing device combining roll crushing and diamond dressing, is fully illustrated and described as to construction features, details, and specifications in a four-page folder issued by the Moore Special Tool Co., Inc., 740 Union Ave., Bridgeport 7, Conn. Copy free.

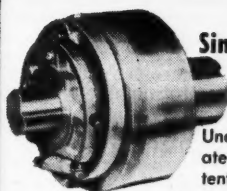
**Sheldon Precision Machine Tools.** The Sheldon Machine Co., Inc., 4250 N. Knox Ave., Chicago 41, Ill., is now distributing a four-page folder which illustrates in color and lists complete specifications of its Sheldon TRB-S56 Precision Lathe, Sheldon-Vernon No. 8000 12-Inch Shaper, and Sheldon-Vernon No. 3000 Size O. Milling Machine. Copy free upon request.

**"Die Slick for Die Casting Dies"** is the title of a four-page two-color folder issued by G. W. Smith & Sons, 5400 Kemp Rd., Dayton 3, Ohio, which outlines the general properties and advantages of the four grades of Die Slick available for die casting die and machine lubrication. It recommends the specific grades to be used in producing zinc, aluminum, magnesium, brass, or lead die castings. Copy free upon request.

**Landis Tool No. 1 Vibrating Work Loader** for use with centerless and centerless thread grinding equipment in feeding standard size cylindrical workpieces of 0.112 to 1/2 inch in diameter and up to 1 inch long is the subject of a four-page two-color bulletin prepared by the Landis Tool Co., Dept. MMS, 16 E. 6th St., Waynesboro, Pa. Included are engineering data, illustrations, and prices relative to the work loader. Copy of Bulletin VL-48 free upon request.

**Thrifmaster Multiple Spindle Drillheads** for drilling, tapping, reaming, and boring are pictured and described in a four-page two-color bulletin issued by the Thrifmaster Products Corp., Dept. MMS, 1048 N. Plum St., Lancaster, Pa. Specifications and drilling data for adjustable gear driven and universal joint type drillheads are presented. In addition, information on special types of drillheads are contained in the bulletin, copy of which is available free upon request.

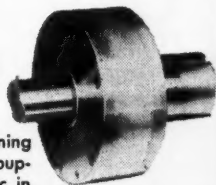
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Unequalled for accurate control of intermittent machine operations. Gives closer tolerances to cut-off, stamping, shearing, and similar machines. Completely automatic with manual, electrical, or mechanical control.

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"Production News from Snyder" is the title of a two-color folder published by the Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit 7, Mich., illustrating and discussing the facilities of the company for building special purpose machinery. Shown and described are an automatic in-line transfer type machine for performing multiple operations on engine blocks and a special machine for performing 12 successive operations which provide for the complete processing of 375 parts an hour (at 80 per cent efficiency) from rough bronze castings. Copy free upon request.



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20" Long x 12" Wide x 6 1/4" Deep  
16 Ga., drag holes, handles both ends.

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**Diamond Tools.** Diamonds and Tools, Inc., 19345 John R. St., Detroit 3, Mich., has prepared a four-page two-color illustrated folder presenting descriptive and tabular information, including prices, on a complete line of diamond tools for all industrial purposes. Copy free.

**Brown & Sharpe Permanent Magnet Chucks.** A four-page two-color bulletin prepared by the Brown & Sharpe Manufacturing Co., Providence 1, R. I., presents illustrated, descriptive, and tabular information on rectangular model and rotary model permanent magnet type chucks. Magnetic chuck adapters are also shown and described. Copy free upon request.

**Flexrock Process Mechanical Packing** for valve stems and centrifugal pumps is described in a ten-page pocket-size folder published by the Flexrock Co., Packing Division, Dept. MMS, Filbert and Cuthbert Sts., Philadelphia 4, Pa. Data are also presented on Ray Pak Synthetic Fiber Hydraulic Packing, Plastic-Gasket and Turboseal Gasket Materials, and Pipeasy Pipe Thread Compounds. Copy free upon request.

**Nicholson Welded Floats** of stainless steel, Monel, and steel construction in spherical, elliptical, and cylindrical shapes for pressures from vacuum to 4,800 lb. are fully illustrated and described in an eight-page two-color bulletin released by W. H. Nicholson & Co., 136 Oregon St., Wilkes-Barre, Pa. Volume and buoyancy data are included together with tables presenting list prices of the various floats. Copy of Bulletin No. 348 free upon request.

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**Scalemaster Weld Cleaning Hammers.** A leaflet illustrating and describing two models of weld cleaning hammers and presenting dimensional and price information on same is now available free from the Industrial Products Co., 2820 N. Fourth St., Philadelphia 33, Penna.

**Penjaska Universal Gauge** for form and hole sizes is illustrated and described as to construction features, principle of operation, and so on, in a four-page two-color folder issued by the Penjaska Tool Co., Dept. MMS, P. O. Box 210, Owosso, Mich. Copy free upon request.

**Perry Fact Sheet.** A large, full-color fact sheet released by the Perry Metal Products Co., Inc., Sales Development Division, 1125 Atlantic Ave., Brooklyn 16, N. Y., provides a graphic record of many years of diversified manufacturing experience. Actual photographs, together with descriptions, of component parts, ready-to-install assemblies, and complete products for the automotive and transportation industries, electrical and industrial equipment manufacturing fields, and so on, are presented. Copy free.

**Hendey No. 2 General Purpose Lathe,** product of The Hendey Machine Co., Torrington, Conn., is the subject of an eight-page bulletin issued by this firm. The various features of the lathe are clearly shown and discussed, and a table of principal specifications is provided. Copy free upon request.

**Greenerd Hydraulic Presses.** A four-page illustrated bulletin issued by the Greenerd Arbor Press Co., 41 Crown St., Nashua, N. H., presents complete descriptive information, including specifications, on its 4, 6, and 8-ton hydraulic presses for production work. Copy of Bulletin No. 112 free upon request.

**Douglass Taper Cutting Attachment.** A circular illustrating and describing a taper cutting attachment with quickly adjustable center for use with lathes of its manufacture is now being issued by the Douglass Distributing Co., 3615 S. Grand Blvd., St. Louis 18, Mo. Instructions for installing the attachment are included. Copy free upon request.



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"Horse & Buggy Methods or Visual Planning" is the title of a four-page illustrated folder published by the Visual Planning Equipment Co., Pittsburgh 6, Pa. The folder presents data, including price figures, on complete visual planning equipment for industry. Copy free upon request.

"Reducing Concentration of Stresses." The Technical Dept., The Osborn Manufacturing Co., 5401 Hamilton Ave., Cleveland, Ohio, now has available a report on "Reducing Concentration of Stresses by Removing Sharp Edges and Burrs and Blending Machining and Grinding Marks with Brushes." Copy free upon request.

Ledeen Heavy Duty Cylinders. A four-page two-color bulletin suggesting 20 individual uses of actuating cylinders for oil, water, or air operation has been published by the Engineering Products Co., 1600 S. San Pedro, Los Angeles 15, Calif. Time-saving applications for factories and for aviation, petroleum, mining, construction, and other industries are covered. Copy of Bulletin No. 481 free upon request.



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**Brinell Testing Machine Model KDR,** capable of checking up to 800 pieces per hour, including parts varying in diameter and thickness as much as  $\frac{3}{4}$  inch, without moving the elevating screw, is illustrated and described in a bulletin released by Steel City Testing Machines, Inc., 8843 Livernois Ave., Detroit 4, Mich. Copy free upon request.

**Frasse Stainless Steel Analysis Chart.** A file size chart listing 31 standard stainless steels and a chemical analysis of each is now being distributed by Peter A. Frasse & Co., Inc., 17 Grand St., New York 13, N. Y. The chart is of heavy card stock and is designed for wall or desk use. Copy of Chart Sec. A, No. 1 free upon request.

**Kent Duplex Automatic Drilling Machine** for the fast, economical drilling of machine screw products is illustrated and described in a four-page bulletin prepared by The Kent Machine Co., Cuyahoga Falls, Ohio. Specifications of the machine are included. Copy free upon request.

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2-56 to  $\frac{1}{4}$ "**

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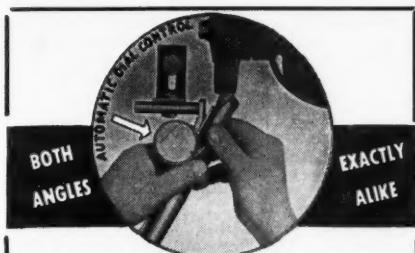
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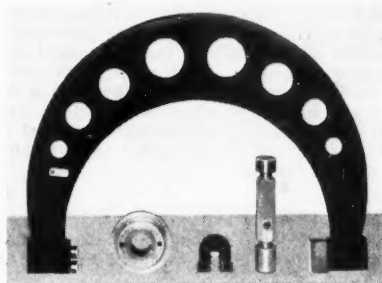
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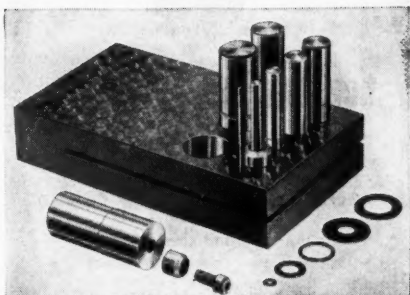
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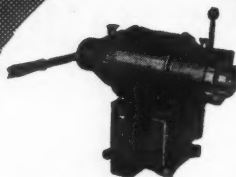
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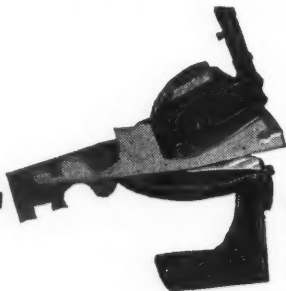
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**Profilometer**, a direct-reading shop instrument for measuring surface roughness, is the subject of a six-page profusely illustrated two-color folder issued by the Physicists Research Co., Ann Arbor, Mich. The features, function, and application of the unit are fully discussed. Copy free upon request.

**"Holding for Milling"** is the title of a four-page two-color bulletin issued by the Rockford Magnetic Products Co., Inc., 1826 Ninth St., Rockford, Ill., which illustrates and discusses the use of "Power-Grip" Chucks for holding shafts for keyway milling, for holding castings for milling, and for quick, accurate holding of diversified toolroom work. Copy free upon request.

**Bryant Air-Hydraulic Equipment.** A complete line of air-hydraulic equipment, including air-hydraulic presses, impact hammers, exhaust valves, four-way valves, Presvises, and mufflers, is described in an eight-page illustrated catalog released by the Bryant Products Distributing Co., De Luxe Bldg., 297 W. Michigan Ave., Jackson, Mich. Copy free upon request.

**Hyprez Diamond Compound** for use in finishing steel, carbides, and other materials is the subject of a four-page two-color circular prepared by the Sapphire Products Division, Elgin National Watch Co., Aurora, Ill. The circular provides a concise explanation of the compound and tells where, how, and why it is used. It also lists specific recommendations for the use of the product on carbides and steel. In addition, prices are included in the circular, copy of which is available free upon request.

**1948 Catalog of Technical Books** has been issued by The Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y. The catalog lists the latest books on chemistry, physics, science, technology, petroleum, formularies, engineering, metals, technical terms, building construction, and so on. Conforming with the requests of technical and scientific workers and librarians, the catalog gives the date of publication of each book, as well as price, number of pages, detailed descriptions, and full table of contents. Copy free upon request.

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9/64"	12	9	1.50	11/32"	12	9	2.25
5/32"	12	9	1.50	23/64"	12	9	2.50
11/64"	12	9	1.50	3/4"	12	9	2.50
3/16"	12	9	1.50	25/64"	12	9	2.75
13/64"	12	9	1.60	13/32"	12	9	2.75
7/32"	12	9	1.60	27/64"	12	9	3.00
15/64"	12	9	1.75	7/16"	12	9	3.00
1/4"	12	9	1.75	29/64"	12	9	3.25
17/64"	12	9	1.85	15/32"	12	9	3.25
9/32"	12	9	1.85	31/64"	12	9	3.25
19/64"	12	9	2.00	1/2"	12	9	3.25
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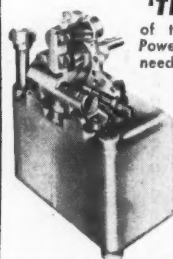
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17/32"	15	12	\$ 6.50	27/32"	15	12	\$11.50
9/16"	15	12	7.00	3/4"	15	12	12.00
19/32"	15	12	7.50	29/32"	15	12	12.50
5/8"	15	12	8.00	15/16"	15	12	13.00
21/32"	15	12	8.00	31/32"	15	12	14.00
11/16"	15	12	8.25	1"	20	15	16.00
23/32"	15	12	8.50	1-1/16"	20	15	17.00
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13/16"	15	12	11.00	1-1/4"	20	15	22.00

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**Morse Silent Chain Stock Drive Catalog.** The Morse Chain Co., Dept. MMS, 7601 Central Ave., Detroit 8, Mich., is now issuing a catalog complete with specifications, service factors and classifications, and installation data on stock drives. The three simple steps required for assembly and disassembly of all types of Morse Silent Chain are graphically illustrated in the catalog, which also includes installation and maintenance information on the silent chain drives, together with data on the type and size of drives to be used for certain installations. Copy of Catalog C71-48 free upon request.



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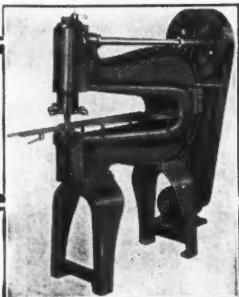
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"Engineered Hydraulics" is the title of an eight-page two-color brochure issued by the Adel Precision Products Corp., Burbank, Calif., which illustrates and describes a line of precision-built hydraulic equipment for precise control, including power pumps, control valves, cylinders, power packs, and relief valves. Copy free upon request.

**Greenard Hydraulic and Hand-Operated Arbor Presses.** The Greenard Arbor Press Co., 41 Crown St., Nashua, N. H., has prepared a 24-page catalog covering its line of hydraulic and hand-operated arbor presses, including pilot wheel and lever type arbor presses in tonnages from  $\frac{1}{4}$  to 30 tons and hydraulic presses in tonnages from  $1\frac{1}{2}$  to 30 tons. Copy of Catalog No. 40 free upon request.

"Ruf-Tred" Tool, a vibrating electrode holder which can be used with either a.c. or d.c. welding machines to deposit hard rough bead lines to prevent slipping and falling accidents on smooth steel or iron surfaces, is described in an illustrated bulletin now available free from the Metallizing Engineering Co., Inc., Safety Products Division, 33-14 30th St., Long Island City 1, New York.

"How a 1000-Year-Old Idea Helps Solve Today's Metal-Forming Problems" is the title of an interesting four-page folder prepared by the C. W. Torngren Co., 82 Skilton Ave., Somerville 45, Mass., which discusses Mecatorm, a mechanical process of precision forming of metal utilizing extraordinary pressures under such control at point of contact that resultant shapes are said to have uniform strength and metallurgical constancy. Copy free upon request.



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All Tool Fixture for use in grinding, milling, drilling, inspection, indexing, and other operations is illustrated and described in a four-page bulletin issued by the All Tool Co., 111 Long Ave., Hillside, N. J. Views of typical installations of the fixture are included, together with illustrations of typical work done using the fixture. Copy free upon request.

High Standard Deep Hole Drills. A four-page two-color folder issued by The High Standard Mfg. Corp., 262 Whaley



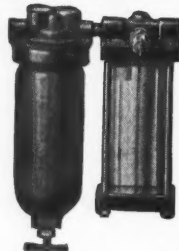
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Ave., New Haven, Conn., illustrates and describes deep hole drills for the automobile, aviation, farm machinery, firearms, household appliance, machine tool, ordnance materiel, railroad equipment, and other industries. Copy free upon request.

Globe "Autostart" Grinders and Buffers, formerly manufactured by U.S. Electrical Motors, Inc., are described and illustrated in Catalog No. 901 issued by the Globe Products Manufacturing Co., Dept. MMS, 3380 Robertson Blvd., Los Angeles 34, Calif. The catalog covers the advantages of asbestos-protected motors and other outstanding features in the Globe Autostart line. Copy free upon request.

Latrobe Inspection Disc Service. An eight-page two-color booklet prepared by the Latrobe Electric Steel Co., Latrobe, Pa., discusses a quality control service for tool and die steel users recently announced by the company wherein it will supply hardened, tempered, polished, and etched discs with every mill order for Desegatized Brand high speed and high carbon-high chromium steel bars. Copy free upon request.

Metal Marking Tags. A standard line of metal marking tags for use in every industry for marking, identification, and shipping purposes is illustrated in actual size in a six-page two-color catalog issued by The Metal Marker Mfg. Co., 1388 E. 40th St., Cleveland 3, Ohio. Illustrated are various sizes and shapes of tags which can be ordered by number direct from the catalog with the purchaser specifying lettering and consecutive numbering to be stamped or embossed. Copy free upon request.

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But the Plan requires sponsorship by top management to keep employees *aware* of its benefits. The Treasury Department has prepared a kit of materials for you to distribute among key personnel. Be sure to use it! For help, call on your Treasury Department's State Director, Savings Bonds Division.

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*Bulletin M-12.*  
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"Colorflex-Plus," a synthetic resin base penetrating color-coat for inside and outside use over concrete, masonry, metal, and wood, is described in a four-page colorful folder published by the Flexrock Co., Dept. MMS, Filbert and Cuthbert St., Philadelphia 4. Pa. Copy free.

**Norton Surface Plate.** A four-page two-color folder published by the Norton Co., Worcester 6, Mass., illustrates and describes a ceramic surface plate having an especially developed surface that is said to allow for rapid and easy movement of instruments and work across the plate without excessive drag and without vibration. Copy free upon request.

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the "Where to Get It" section of MODERN MACHINE SHOP, originated in February, 1940, provides a quick reference to machinery, tools and supplies advertised in the current issue. Use it consistently. You'll find it's very helpful. (See pages 352, 353 and 354.)

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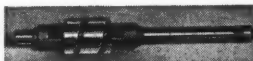
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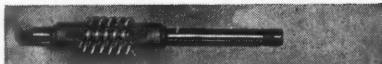
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"Optimum Recovery with the Mikro-Collector" is the title of an illustrated booklet announced by the Pulverizing Machinery Co., 196 Chatham Rd., Summit, N. J. The features of the Mikro-Collector for dust collecting are described in text and illustration. Filter rates, dimensions, weights, and other details are tabulated. Copy free upon request.

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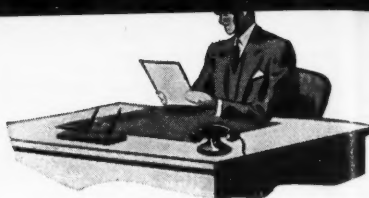
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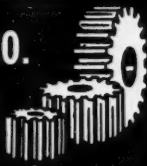
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"Grits and Grinds" Vol. 39, No. 3. This particular edition of the technical house organ published by the Norton Co., Dept. MMS, Worcester 6, Mass., commences with an article entitled "New Alundum Abrasive Permits Heavier Feeds" written by a Norton Company sales engineer. Following this article "Ten Rules for Better Grinding and Wheel Life" are presented, as well as short articles entitled "Vitrified Diamond Wheels Reduce Carbide Tool Grinding Costs" and "Loaded and Dulled Wheels Quickly Resharpened."

Copy of "Grits and Grinds" Vol. 39, No. 3 may be obtained free upon request to the Norton Company.

"132 Unusual Uses for Spencer Vacuum" is the title of a 20-page three-color bulletin published by The Spencer Turbine Co., Dept. MMS, Hartford 6, Conn. The bulletin includes illustrations and descriptions on the use of Spencer equipment for the removal of liquids, gases, precious metals, dusts, and other materials, as well as an extensive outline of Spencer Vacuum as a conveyor of materials with capacities up to four tons per hour. The application of vacuum as an integral part of machine design is also described and illustrated. A total of 64 illustrations are contained in the bulletin, copy of which is available by requesting Bulletin No. 144.





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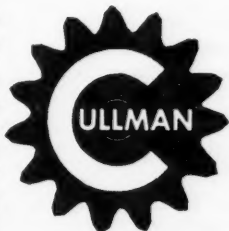
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## Over the Editor's Desk

---

### Light the Candles

**W**ith this issue MODERN MACHINE SHOP is lighting twenty candles on its birthday cake—for it was twenty years ago this month that MODERN MACHINE SHOP was born. This magazine was brought forth to meet a need—a need for a magazine that would carry concisely-written, well-illustrated news of the newest developments in the metal manufacturing industries to the operating executives in the thousands of plants in those industries in this country and other countries throughout the world.

That the need was obvious is attested by the fact that MODERN MACHINE SHOP grew rapidly in volume. With service to the industry as their objective, the publishers and editors of this magazine have spared neither effort nor expense in carrying to their readers the most pertinent information available. During these twenty years MODERN MACHINE SHOP editors have traveled the length and breadth of the North American continent, visiting plants and shops, studying new techniques and processes that the story of these developments might be presented to MODERN MACHINE SHOP readers.

In these twenty years MODERN MACHINE SHOP has made friends all over the world, wherever metal manufacturing operations are performed. Letters come to this office daily not only from plant owners and industrial executives in America but from many foreign countries asking for information on methods or processes or sources of supply for equipment and materials. During the war cablegrams came to us from as far away as South Africa and India asking for information. The realization that MODERN MACHINE SHOP has come to be recognized as a dependable service institution has not only given the staff the feeling of satisfaction that comes with recognition of a job well done but has spurred the members of the staff on to do an even better job and to render an even better service—if possible—in the future than it has been able to do in the past.

In our efforts to serve this industry, however, we have never lost sight of the fact that the opportunity for this service has been made possible by the faith and trust and cooperation of our clients. Twenty years ago we promised these clients that we would render a service of a type and quality that had never before been achieved in this industry. In return we asked for their support, and the extent to which they have given this support is evidenced by the number of pages of advertising that MODERN MACHINE SHOP is now carrying. Reaching more metal-working plant executives than any other magazine published for the metal manufacturing field, MODERN MACHINE SHOP has become the market place of the industry for the machine tools and the small tools and shop equipment upon which the industry depends.

With this issue we pledge ourselves anew to the task that we assumed twenty year ago. With this issue we also take opportunity to thank the thousands of readers whose cooperation has helped us to build a successful service, and the hundreds of clients without whose support such service would have been impossible.



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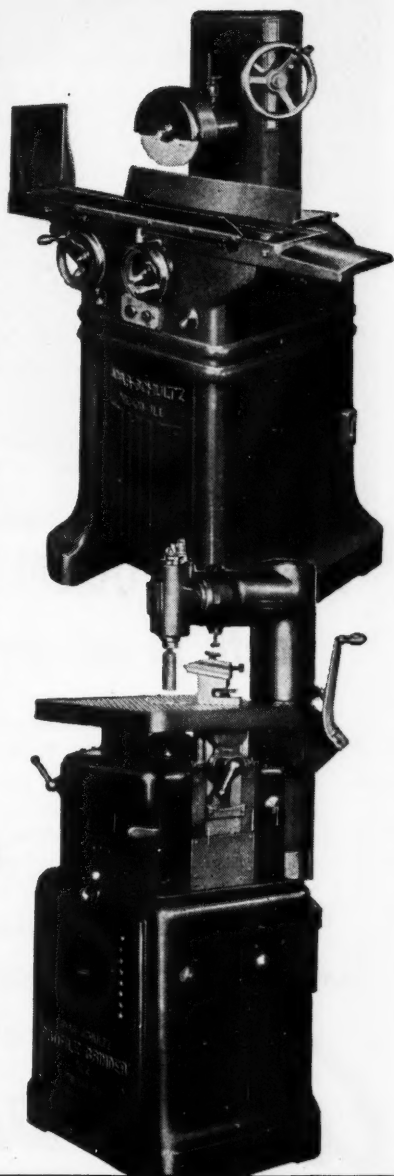
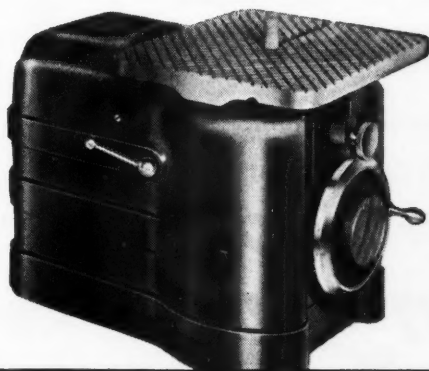
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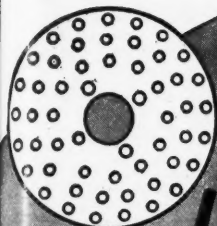
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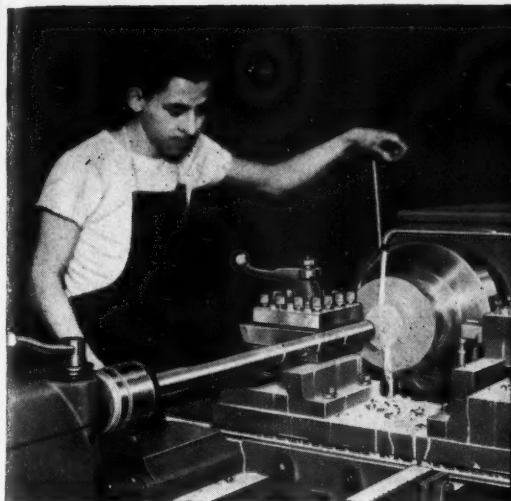
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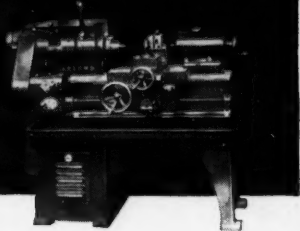
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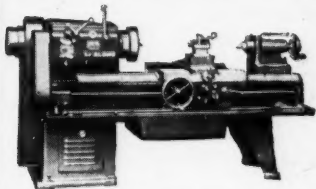
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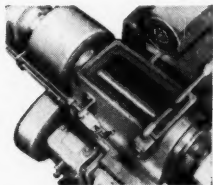
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